FOOD INDUSTRIES

JUNE 1939

HOMES OF FAMOUS FOODS...PILLSBURY'S BEST FLOUR, MINNEAPOLIS

IN THIS ISSUE: Food and the National Defense, p. 307

Legal Liability Under Food Law, p. 329

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THERE are over 100 leading food manufacturers who depend on Pneumatic-made carton linings to maintain the flavor or crispness or appearance of their products. These leaders use machine made and inserted liners to keep the cost per package down to a minimum.*Although this cost will vary according to carton size and kind of lining material a fair example is the average 8 oz. cornflakes box. The cost of a waxed glassine liner for this carton (266 square inches) will not exceed $2.40 per thousand linings.

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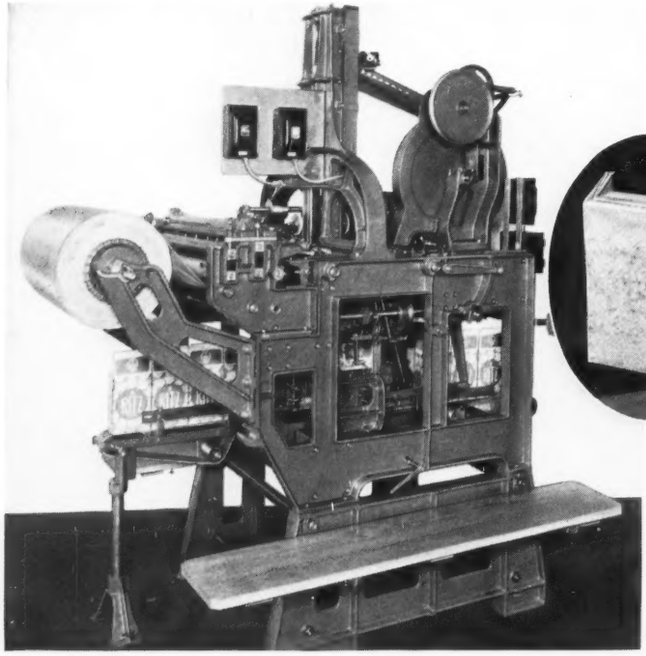

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Contents for JUNE 1939

VOLUME II • NUMBER 6

FOOD TECHNOLOGY

New Discoveries and Inventions

Methods of Preservation

Spices and Spoilage 339
Better Storage Eggs by CO_2 Oiling 339

Bakery Products

Milk Protein in Baking 339
Problems of Dough Mixing 339
Water Content of doughs 339

Beverages

Orange Juice Made Stable 358
Beer Freed From Bitter Sediment 358

Canning and Pickling

Brix Better Than Baumé for Pickle Finishers 359
Method for Making Vegetable and Fruit Pulps 359
Producing Dill Pickles in the South 359

Confectionery

Dextrose Confectionery Creams 360
Chocolate Refining Speeded Up 360

Dairy Products

How to Hasten Ripening of Cheese 360
Bacteriology of Paper Milk Containers 361

Sugar and Starch

Emulsifying Agent from Starch Factory Wastes 361
Lactic Acid from Sugars 361

Meats

Meat Color Stabilized 362

Miscellaneous

Chemical Elements Essential for Life 362
Mannan from Tubers 362
Fine Grinding Gives Rancidity-Free Coconut Paste 363
Odor of Yellow Corn 363

★HOMES OF FAMOUS FOODS

Food Industries' cover this month shows the Minneapolis, Minn., mill where Pillsbury Flour Mill Co. makes its world-renowned flour, "Pillsbury's Best."

THIS MONTH

Food and National Defense 307
Remember "Meatless Tuesdays"? 308
No More Mouths to Feed in War Time 311
How the Army and Navy Buy Food 313
The "Key Man" Problem 315
Nothing Can Take the Place of Your Own Trucks 316
What Would a "War Load" Mean? 317

Mistakes to Avoid in Packaging—Part IV 330

Packages and Public Relations—Part II 333
A Public Relations Feature—*By Ivan C. Miller*

PROCESSING

Another Angle on Sugar Refining Costs 319
By L. Wickenden and S. W. Anderson
How to Use Lactic Acid in Pickle Products—Part II 324
By C. K. Wadsworth and F. W. Fabian
These Food Plants Cut Operating Costs—Part II 326
By C. R. Earle
Protecting Your Legal Liability Under New Food Law ... 329

DISTRIBUTION

Adapts Standard Truck to Frozen Foods 322
Packages and Public Relations 333
By Ivan C. Miller
New Packages and Products 336
Hints and Hurdles 338

EVERY MONTH

Talk of the Industry	303	The Plant Notebook	348
Automotive Section	322	Catalogs	349
The Food Industry News	340	Food Equipment News	351
Business Trends	344	Book Notes	364
Men, Jobs and Companies	346	Patents	364

For something about authors and forthcoming issues, see next page

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In THIS *Issue*

• DON'T GUARANTEE TOO MUCH . . .

Some wily distributors have a way of asking an unsuspecting food manufacturer to sign a special guarantee under the food law—a guarantee that would be most unwise to sign because it goes way beyond all reason or needs.

Probably you are not in the canning business, but you should read—nay study—carefully the recommendations of the National Canners Association on the proper form of guarantee under the new food law. The splendid feature of this form of guarantee is that it has been considered and approved in a conference between representatives of wholesalers, cooperative distributors, supermarket operators and food brokers.

The principles of law set forth by H. Thomas Austern, attorney for National Canners Association, apply to all food manufacturers who do any interstate business. You'll find it on page 329.

• SWEET AND HOT . . .

Down in Washington the battle of the sugar waxeth strong. You will read about it in the news pages. But that is not the only sugar battle. You will find another scrap in the pages of Food Industries over the cost of refining sucrose. It's an old battle that seems to come up once every generation. On page 319, Suchar's Messrs. Wickenden and Anderson have jumped into the controversy which heretofore has been between Applied Sugar Laboratories and Mr. Chapin, a sugar engineer of many years of experience.

Out of all this heat there should come quite a lot of light. Anyhow we like a vigorous polemic (which is scientific for a row).

• GETTING IN THE PROPER LAST WORD . . .

"Last call for public relations work." That might well be the food manufacturer's slogan when he kisses his product a fond farewell at the shipping platform. After that, the packages and products must stand on their own, and what they do to promote consumer good will and repeat orders will be reflected definitely in the food manufacturers balance sheet.

So on pages 333 and 334 are set forth a number of the things that the manufacturer can do to help his products and packages live up to this responsibility.

• HE TELLS YOU HOW TO CUT COSTS . . .

It's the little things that count—a statement that is proved once again by Chester R. Earle, in his article on page 326 of this issue. In April, Mr. Earle told how a number of food plants had made large savings in the generation of steam and electricity. In his second article, he carries his study out into the plant, and shows how savings can be made in the distribution and use of electricity, steam, compressed air and refrigeration.

It's all done with instruments. And Mr. Earle knows how it's done. That's his business.

In FORTHCOMING *Issues*

• EXCLUSIVE FEATURE . . .

If all goes well, Food Industries will soon publish, perhaps in July, the new Bureau of Agricultural Economics tentative standards of quality grades for Frozen Peas, together with an accurate reproduction of the color specifications. This will inaugurate what is hoped to be a series of such standards for grades of quality.

The government's mimeographed form lacks the color standards that are necessary to apply. The BAE is identifying the color in terms of "Dictionary of Color" by Maerz and Paul, published by McGraw-Hill Book Co.

All who produce, buy or sell frozen peas will need these Food Industries color charts. As fast as the government promulgates new grades, we plan to supply our readers with appropriate color charts printed into the definition of the grades. You can expect to see such grades on meats, canned beets, cheese, butter, dried fruits, maple sirup and perhaps others in the next 24 months.

• INSIDE DOPE ON PROCESSES . . .

August and "Dog Days" always makes reading something of a chore. With this in mind, we are planning something special for food engineers and technologists that will hold the interest without taxing the eye.

The feature we have in mind is another batch of blueprint flow sheets, similar to those published in Food Industries for December, 1937, and also in the 1939 edition of the Food Industries Catalogs and Directory. These new flow sheets will bare the inner workings of an additional group of important food manufacturing processes. By showing how the other fellow lines his process up, they will help you decide whether your own layout can be profitably modified.

• PICKLES IN PROSPECT . . .

Salting and finishing of various types of pickles is a subject that will be covered exhaustively in a series of articles that will begin soon. The author has had a lifetime in this field and gives formulas as well as full working directions.

This is the first time for Food Industries to publish commercial formulas. If you manufacture pickles, or produce supplies needed in the pickle business, you can't afford to miss them. It will take about a year to run off the series.

In another month or two the series of "Mistakes to be Avoided in Packaging" will be completed. The big question is whether or not to reprint the whole lot. Much depends on what our readers say. Do you want them enough to pay two-bits per copy?

FOOD INDUSTRIES

DISTRIBUTION • PROCESSING

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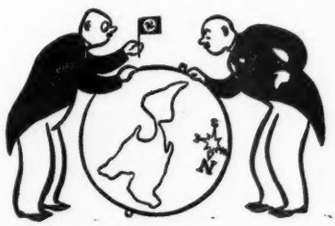
LAURENCE V. BURTON, Editor

Volume 11, Number 6 June 1939

The Talk of the Industry

» INNOVATION: If you will look on the page following the contents page, you will find a bit of explanatory matter about authors and what they have done; also about articles appearing in this and future issues.

» A VISITOR at the German embassy in Washington last month was impressed by two things: (1) A huge globe turned with the South Pole



uppermost, apparently to locate their newly claimed polar discoveries. (2) The embassy officials cannot understand why Germany, alone of all the nations of the earth, is on our black list and must pay 25 per cent more duty than any other.

» ALL THE TALK about Argentine canned corned beef hands us a laugh. Nearly all well-known brands of corned beef and corned beef hash have had South America as their principal origin since about 1925.

» IN SOMEWHAT THE SAME SPIRIT with which Ponce de Leon once sought the invigorating waters that were said to abound in Florida, we drank our rations of unflavored gelatin exactly as prescribed by Knox. In 24 hours it was necessary to follow it with a liberal portion of $MgSO_4$. Plainly Nature did not intend us to exceed the strength and endurance of other mortals.

» IN THESE DAYS, it is something to be grateful for, if one is devoid of an active imagination. Anyone who is old enough to recall the happy days around 1910, and the tragic events of 1914, 1917 and later, finds ample reasons for a heavy heart as to the future of civilization. For those of us who went to grade schools in the pre-war years from 1900 on, military history was something in books.

In 1917 we awoke from our dream, went overseas, returned believing we had fought a war to end all war. After this time, armed conflict would be found only in the record.

Yet another world war appears to be in the making. What the nations will be fighting for will be as obscure as the reasons for the first World War. Nobody knows the reasons for that conflict any more than we know the reasons for the conflicts of the medieval period when petty kings warred unceasingly against each other. Nevertheless, the majority of Americans instinctively feel that Hitler and Mussolini and their followers mean increasing trouble for the United States despite our desires to avoid trouble.

If war should come to the democracies, what can prevent our being ultimately drawn in? If we must fight, we must win. Defeat is unthinkable.

» THE CALIFORNIA LAW permitting pari-mutuel betting on horse races seems to be netting the State a very large "take." Since the law requires that the "take" be utilized for the benefit of agriculture, the farmers propose to use it for advertising California crops. Which reminds us of an early parental admonition to the effect that advertising is like making love to a widow: you can't overdo it.

» PITY SECRETARY WALLACE. According to the Supreme Court ruling, in the Kansas City Stockyard Case, the Secretary's orders were invalidated because he had not read *all* the testimony after a hearing was held. Some

of the food standards hearings run into hundreds of pages of testimony.

» BEST WISECRACK of the month occurred at the Battle of Sugar in Room 4639, South Building, U. S. Department of Agriculture on May 1. Said a prominent attorney, after listening to labored explanations as to what a consumer would expect, "I thing we should stop calling them Consumers and call them Presumers."

» SECOND BEST WISECRACK occurred in response to the foregoing. Said a

government officer in an off-the-record aside, "I am utterly astonished at the number of things that Consumers know, that are not so."

Benefits of the Lea Bill

A QUICK SURVEY of the situation in early May among large food manufacturers revealed that not one of them would admit that it would be impossible to comply substantially with the labeling requirements of the Food, Drug, and Cosmetic Law by June 25.

On the other hand, it was discovered that many would be very happy if the Lea Bill were to be enacted and thereby postpone the effective date. This would give them an opportunity to work off inventories of old labels. One concern was reported to have on hand an inventory of labels that would become obsolete on June 25 amounting to more than $200,000.

Fuel Problems

MANY A PLANT MANAGER has looked unhappily at his dwindling coal pile during the recent imitation of a coal miners strike and wished he had oil burning equipment all installed with tanks full of oil and ready to work.

As long as John L. Lewis is on the loose, perhaps it would be advisable to equip boilers for more than one kind of fuel. The present miners' contracts will expire on April 1, 1941. You have two years in which to prepare for possible further stoppages.

Elementary Public Relations Matters

PUBLIC RELATIONS begin at home, first, last, and always. Here is a simple matter which should merit attention in any business. It's one of those homely things that most of us never think about.

Suppose you dictate a letter. If the name of your correspondent is misspelled, if his initials are incorrect, or if the firm's name is misspelled or an incorrect address is given, you or your secretary have been guilty of contributing to poor public relations. Somebody is going to be a trifle annoyed—sometimes even peeved.

And is your signature decipherable? Do you write in your name in a hopeless scrawl that nobody can read? When this occurs, when you can't write your own name clearly, then your secretary should be instructed to type your name *under* the place for your signature—not over on the left-hand margin. This will save the other fellow's time and avoid a minor irritation. It's all a part of cultivating good public relations.

Demand Tax Revision

PRESIDENT ROOSEVELT'S unwillingness to permit the U. S. Treasury's tax revision plan to go to Congress with his blessing must be laid to pure politics. Those who know the attitude of top Treasury officials realize that if their plan were adopted, it would do as much to restore business confidence and incentive as a change of administration.

The Treasury plan is noticeably in conformity to the Brookings Institution's analysis of the taxation problems facing the nation. And no one can honestly charge that scientific body with any bias. Fundamental, according to the Treasury's view, is the popular confusion of *rates* of taxation with *amount* of tax yield. Unless business can make profits there is no progress. Already we have reached tax rate levels that yield less revenue, instead of more, when taxes are further increased. This demands downward revision as a means to obtain more money because it will stimulate business and give enterprising men a profitable reason for doing things.

Our politically-minded President seems to fear, however, that his sanction of the Treasury plan would be interpreted by his supporters as a complete sell out to business. This, despite the fact that the wisest economists are pretty much in agreement that existing taxation is a hindrance to recovery and needs reform.

Members of the House Ways and Means Committee and the Senate Finance Committee are privately in favor of the Treasury plan of tax reform, which has not been placed before them in official form, though, doubtless, all are familiar with it.

Much needed now is a flood of letters and telegrams to both committees to encourage them to call for the Treasury plan, despite its lack of presidential blessing. Apparently F.D.R. will not object if the reform comes without his support. You can perform no more useful service today than to communicate with your own Congressmen and the two committees, urging them to enact the plan elaborated by Morgenthau, Hanes, and other Treasury officials.

Hors d'Oeuvres

• *In 1500 BC it was known that eating animal livers (rich in vitamin A) improved man's vision in dim light. In AD 1938, research revealed that when people get too little of vitamin A they can't see properly in dim light. How time flies.*

• Hitler, who has never touched tobacco or alcoholic beverages, now takes an occasional glass of a special brew containing only one per cent of alcohol. Here's mud in your eye, Adolf!

• *If the plan goes through for bartering basic American foods for British war materials it will be a policy of butter for bullets and beans for bayonets.*

• Since 1929 the production of turkeys, America's symbol of Thanksgiving, has increased 56 per cent. Now if we had something for which to be thankful. Or have we?

• *A nut is an indehiscent polycarpellary one-seeded fruit with a woody pericarp. Guess that's telling you!*

• Fifteen billion half-pint bottles of carbonated beverages are sold to the American public annually. Some business, eh pop!

• *The grapefruit is the freshest of all citrus products. It's the only one that squirts you in the eye.*

• A container with a flexible bottom for expelling the contents has been developed by a Frenchman. Maybe it would be a good idea to package condiments and sauces in an oil can so you could season your dinner by the squirt.

• *More than 300 tons of sugar are wasted each year in the bottom of the tea cups of the British Isles, says a statistician. This report is said to be causing a stir in Scotland.*

• The most popular thing at the New York World's Fair, the Aquacade and Eleanor Holm notwithstanding, is the hot dog. The vendor's spiel goes like this: "Ho——ot dogs a dime! Boneless, skinless, harmless and homeless! Who'll have a dog?"

• *Geo. A. Hormel & Co. has equipped salesmen with portable record-playing radios which tell the story of Spam to food dealers. Any day now Armour or Swift may fire their salesmen and put sons of Elektro on the job.*

• In Clinton, Okla., there has been formed Belcher and Bartlett Co. for the manufacture of carbonated beverages. Maybe there is something in a name.

F.K.L.

Changing Character of Food Hearings

SOMETHING sort of screwy seems to be going on in Washington, for the character of the hearings on standards of identity of foods is changing very materially. At the beginning, the hearings seemed to be true inquiries for the purpose of obtaining substantial evidence on which the Secretary of Agriculture should base a standard. To be sure, the earliest new law hearings were somewhat more formal than hearings under the old food law, but this has become necessary because of the rules of procedure laid down in Title 21, Food and Drugs, published in the *Federal Register*, Jan. 13, 1939. This, in turn, is based on Section 701 of the new food law.

The change of character, though gradual, is far from subtle. Instead of partaking of the spirit of inquiry which ought to prevail, the hearings are now exactly like what the lawyers term adversarial proceedings—a court trial—a contest of wits and strength.

The contest now appears to be an attempt to keep the other side, government or competitor, from getting its testimony onto the record, or to discredit the witness who succeeds in introducing the evidence. If you have ever been present at a trial where expert witnesses have been on the stand, you have a perfect picture of what has now come into the food hearings. The witness has to qualify himself as an expert witness exactly as in a civil or criminal trial, and has to withstand vigorous cross-examination that, at times, is vicious. Lawyers object. Objections are sustained or overruled. Exceptions noted.

Here is what you could have seen at the adjourned hearing on Canned Peaches—popularly known as the battle of sugar. At the far end of the table is able presiding officer John M. Fox. Dr. Stroud Jordan of American Sugar Refining Co. on the witness stand is being cross-examined by Professor E. H. Wiegand (standing) of Oregon State College.

No longer do witnesses get on to the stand and have their say. Testimony is now developed principally by questions from attorneys and answers by witnesses. Little voluntary testimony now gets into the record.

Industry's lawyers and government lawyers are bringing about this change. Both are equally responsible.

Instructions to Attorneys

What to do with the overzealous lawyers representing distressed industrial executives is not easy to say. Perhaps some pungent and pertinent remarks from corporation presidents are in order. We are inclined to think that we would give instructions something like this to our attorney, if we had to hire one for such a job.

"Go to Washington. Get all our facts in the record. Do this in a straightforward fashion. Let those whose commercial interests differ from ours do the same. Be overgenerous, if need be, to make the hearing a real record of all the facts. In the long run we should do this for selfish reasons, if no other. Only a complete record will be persuasive on the Secretary and the courts. Only a complete record will insure that we have our facts defensively before the reviewing officers, and ready for the courts, if we should ever have to go there."

Frank H. Hall, attorney for Corn Products Refining Co., apparently has said something very vigorously about which Dr. Stroud Jordan, American Sugar Refining Co., has mental reservations.

Are These Trials or Hearings?

Unless business executives are big enough to see that a full record of *all* the technical facts is made at these standards hearings, there will be boomerangs giving painful and unsightly black eyes to those who least expect them. There is no use in heckling, even inexpert, overzealous Departmental boys, who are assigned jobs beyond their experience, perhaps beyond their real ability. They are trying to do their best. It is excessive zeal which makes these men literalists, fighting for detail that is unimportant, yet ruining the chance to get cooperative real observance of the spirit of the law.

Are these hearings supposed to be trials or are they really hearings?

To any one familiar with court procedure they have all the appearance of an adversarial trial, with the representatives of some group of food manufacturers litigating with representatives of the F.D.A.

One government official, in discussing it with us, exclaimed "Formerly we were accused of being bureaucrats, but here you see democracy gone haywire!"

All the bickering of lawyers, the attempts to discredit witnesses and the long statements of individual attainments of witnesses in an effort to qualify as experts is stretching out the hearings to interminable length. (The hearing on evaporated milk took a week!) One witness, whose testimony on one obscure phase of one optional ingredient, was worth about ten minutes on the stand, was over an hour getting in his direct testimony, and nearly another hour on cross-examination. A good part of the delay on direct examination was due to a certain lawyer who seemed to go to sleep between questions.

Another matter that seems to warrant criticism is the poor preparation of both sides in some of the hearings. If these hearings are to degenerate into administrative trials, there should be better preparation all around. At one hearing, the government's unfamiliarity with current good practice and the reasons for certain practices brought forth much adverse comment from members of the industry. Industry, on the other hand, has been wholly unprepared for what developed and at least once has had to request an adjournment to go home and prepare for the onslaught. In the hearing on canned peaches, the fruit, itself, was a matter of minor importance. The real adversaries were manufacturers of dextrose and refiners of sucrose, with the latter unprepared.

Manufacturers Ought to Sit In

Manufacturers are making the mistake of their lives by not sitting through at least two hearings before their industry's turn comes. It is not enough to send some young lawyer to Washington to listen for a day. From the way things are going it will take more than a youngster with legal training to prepare to meet the possible developments. Some corporation heads ought to get wised up on the true trend of events well in advance of a hearing which affects them.

Disregarding Industry's Suggestions

The government's Committee on Food Standards has apparently failed to pay sufficient attention to the suggestions from industry as to what should be included in a standard of identity. Probably this one thing, more than any other, has contributed to the adversarial character of the hearings. In saying this, one is not overlooking the legal necessities imposed by the new law. If an industry has been invited to submit its ideas as to what is the best definition for a given food and later finds that the government has chosen to propose a tentative standard that is quite different from current good practice, it is to be expected that the industry will put up a battle. Representatives of the government are frequently overzealous. Sometimes they appear to be downright biased in their interpretation of what the new law calls for. If the character of the proceedings changes much further in the direction in which it has moved in the past five months, it is almost a foregone conclusion that each successive hearing will last longer and longer, and that a huge slice of the future moneys appropriated for the Food and Drug Administration will be expended in defending litigation over the *reasonableness* of standards under Section 701(f).

Problem of "General Terms"

Another matter that creates wholly needless antagonism arises from Section 701 (e) which says in part: "The Secretary shall give appropriate notice of the hearing, and the notice shall set forth the proposal (for the standard of identity of the food) in general terms, etc." That word "general" is the trouble maker—at least as it is applied in drawing up the tentative standards as the basis for the hearings. Take the evaporated milk hearing as an example. Here the government proposed a standard of between 17.7 to 18.7 per cent of milk-solids-not-fat for evaporated milk. Many manufacturers are of the opinion that a satisfactory evaporated milk cannot be made at all times with a non-fat-milk-solids content above 18 per cent. And they have come to Washington with blood in their eye ready for mortal combat. Attorneys for Food and Drug Administration on the other hand, privately claim that they had no intention of demanding the top figure but that compliance with the federal statutory requirement to state a proposed standard in *general terms* requires some such broad percentage statement. Some of them privately lament the ignorance of industry about the requirement imposed on them by Congress in that word "general." They aver that bringing up the heavy artillery to knock out the 18.7 per cent figure is a wholly needless and very expensive procedure.

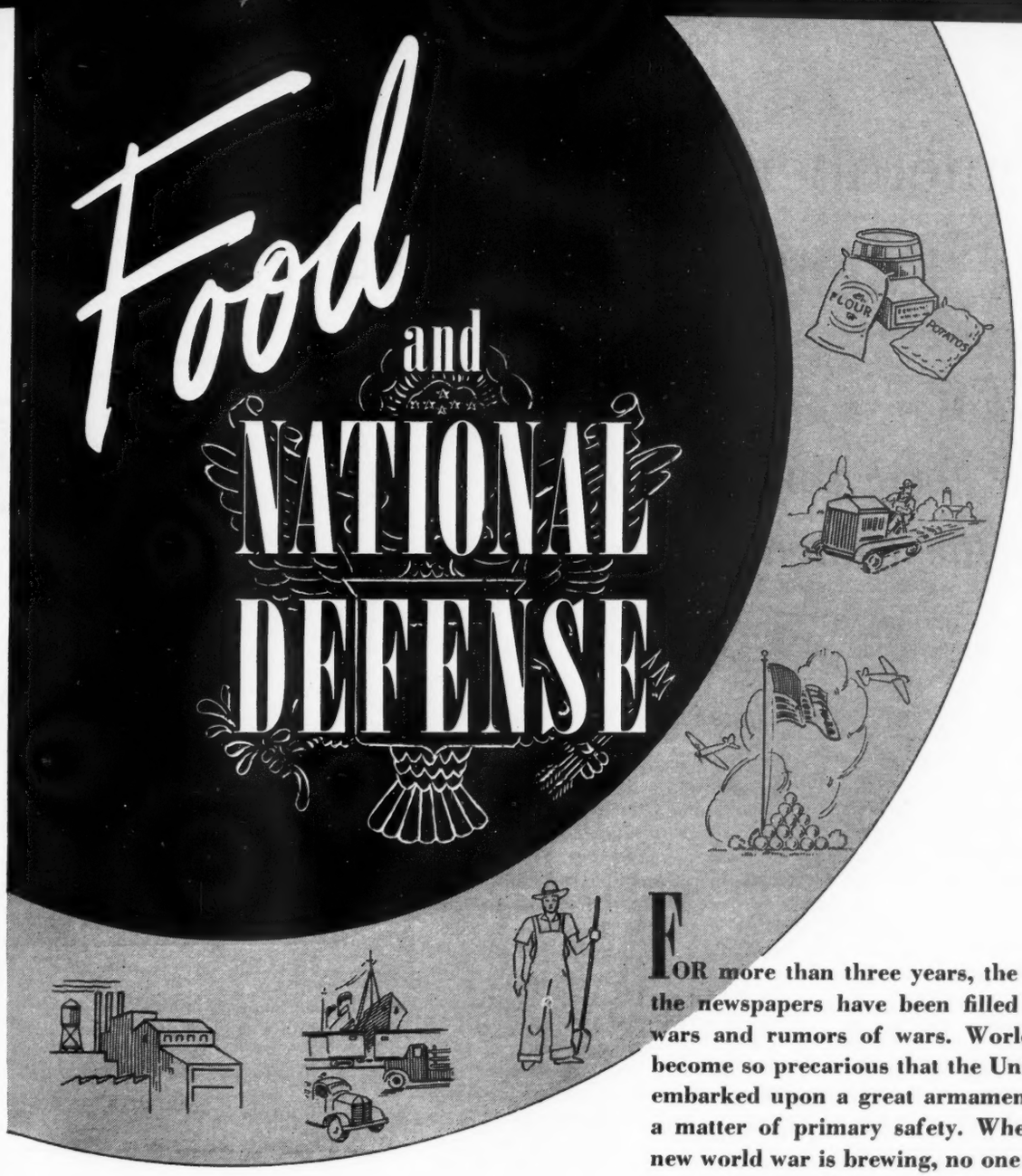
Industry on the other hand is skeptical and not without a certain amount of justification. It is playing safe—costly though it may be.

In the meantime, the hearings are trending toward actual trials, a trend that is time consuming, provocative of hostility and the probability of future litigation, and very costly all around.

Manufacturers of foods which are yet to go through hearings on standards of identity had better be prepared.

Amid the elegant surroundings of the Department of Labor, were held the hearings on standards of identity for milk products. Evaporated milk manufacturers faced the government group which you see before you. Joseph Callaway, Jr., secretary of the Food Standards Committee is the bald gentleman. The others at the table are government lawyers.

Food and NATIONAL DEFENSE



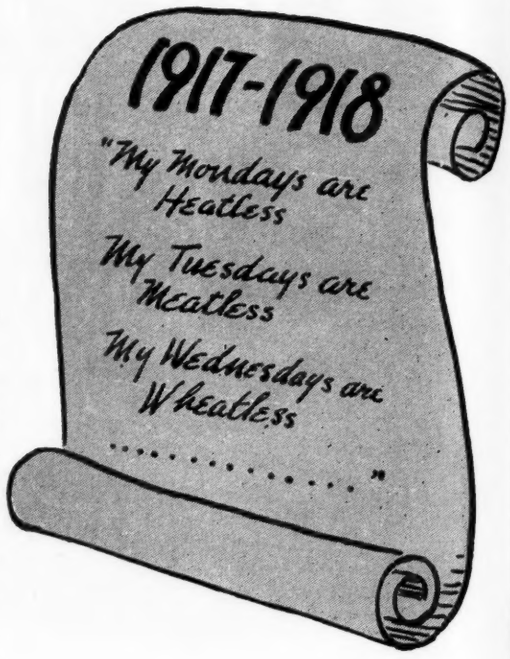
FOR more than three years, the air waves and the newspapers have been filled with news of wars and rumors of wars. World affairs have become so precarious that the United States has embarked upon a great armament program, as a matter of primary safety. Whether or not a new world war is brewing, no one can tell. However, the possibility is sufficiently strong that no food manufacturer can fail to ask himself, "What would happen to my business, if a war involving the United States should break out?"

To answer this question for the food manufacturing industries as far as it can be answered in these times of peace, FOOD INDUSTRIES has gathered from the Army, the Navy, the Department of Agriculture and various other sources what information is available. This has been summarized in a series of articles on the following pages:

What War Would Do to Food Consumption in the United States	Page 308
No More Mouths to Feed in War Time But Some Raw Materials May Be Scarce	Page 311
How the Army and Navy Buy Food	Page 313
The "Key Man" Problem—How Will You Meet It?	Page 315
Nothing Can Take the Place of Your Own Trucks	Page 316
What Would a "War Load" Mean to the Food Manufacturer	Page 317

Remember "Meatless Tuesdays"?

What a War Would Do To Food Consumption in the United States



SUPPLYING the United States with food in time of war is a job that differs greatly from the same activity in peace time. Those who recall the World War of 1917-18 will have memories of "Meatless Tuesdays," curtailed sugar supplies and bread made from several grains rather than white wheat flour.

Changes of this nature are very likely to recur, should another war emergency of World War scale come. In 1917, a good part of the difficulties experienced with the food supply came from the necessity of shipping abroad large quantities of food to the countries associated with us in the War and also to neutral nations caught in the pinch of trade blockades.

Food shipments abroad were not the only cause of food supply troubles. Two other factors made themselves felt. These were the changes in demand among the various foods incident upon changes in occupation among the population brought about by war activities; and difficulties in food supply caused by the general disruption of industry, transportation and labor supply that followed on the tremendous increase in manufacture of war supplies and the call of large numbers to service.

The matter of changes in demand for various foods that occur in war time is of great importance to the food manufacturing industries. Certain foods are needed in much greater quantity than in peace time. Demand for other foods slacks off. Finally, certain food raw materials, because imported wholly or in part, or because of shortage of agricultural labor, or for other reasons, become scarce or entirely lacking.

Consider what foods the population of the country now consumes. This will form a basis for determining the extent of changes in food demand that will occur should a war emergency arise. Table I gives a recent estimate of annual per capita food consumption in the United States, by broad general classes. As this table is made up on the basis of averages for eighteen years, the effects of boom and depression, drought and oversupply, are cancelled out and the figures can be taken as giving a fair picture of civilian demand for food.

Food for the United States Army, in war as in peace, is based on a standard ration. This ration is made up of a sufficient variety of foods to provide the soldier with a balanced diet of around 4,500 calories per day. There are permissible substitutes for many of the items that go to make up the broad classes, such as cereal products or meats, in this ration, but when all the items are lumped together into these classes, as in Table II, a basis is available for comparison with the ordinary civilian diet. This table was made up by FOOD INDUSTRIES from the standard Army ration, by making approximate calculations in pounds per year per man of the ration figures in ounces per day, and then bringing the various items together into a few general groups.

A standard ration also exists for the United States Navy. In Table III, this ration has been converted into pounds per year per man for the same general food groups as shown in Table I and Table II.

When the figures in these three tables are compared, it is at once evident that the man in uniform consumes more food than does the average civilian. It is also evident that the uniformed man eats more of some foods and less of others than does the civilian.

In peace time, when only some 300,000 men are enlisted in the two services, these variations in diet are taken in stride by the food industries, because the quantities involved are rela-

Table I — Average Annual Per Capita Consumption of Principal Foods in the United States (1920–1937)

(From FOOD INDUSTRIES, April, 1939, page 188)

Food	*Pounds per capita per year*
Cereal Products	217
Potatoes	164
Sugars	110
Dairy Products	
Milk, fluid	328
Cheese and other manufactured products	28
Butter	17
Fruits	192
Vegetables	151
Lean Meats and Fish	132
Eggs	30
Beans, Nuts, etc.	14
Fats (except butter)	46
Coffee, tea, spice, flavoring, etc.	17
Total	1,446

tively small. But in war time, when the services are greatly expanded, the changes resulting cause some food manufacturing industries to take on heavy new loads.

Before going into these changes in food demand, note that plans for the conduct of any future war do not contemplate depriving the civilian of his customary foods, if that can be avoided. Therefore, food demand changes must be figured on the assumption that the demand of those who are not in the uniformed service remains the same as the food demand of the civilian in peace.

What is this civilian demand in peace time, based on the whole population, 130,000,000 people, in round numbers? Table IV shows the quantities in Table I, expanding to meet the yearly needs of 130,000,000 people and converted from pounds to tons. These figures represent the gross peace time demand which will be changed by war time shifts.

The same method of expansion can be applied to Army and Navy food supplies. Assume, for the purposes of calculation, that the peace strength of these two services comprises 165,000 men in the Army and 100,000 men in the Navy. Both of these figures would be increased in any war emergency.

ARMY expansion in war time would depend on the nature of the emergency. For purposes of determining Army food requirements it will be intesting to inspect the result of two levels of activity, one demanding an army of 1,000,000, the other an army of 4,000,000 men. The second of these is close to the figure of 1918. Table V shows the food requirements for these two forces, the figures being based on Table II, and converted to

Table II—Annual United States Army Ration Per Man

Estimated by FOOD INDUSTRIES from the official daily ration allowance of the U.S. Army. Figures are round-number approximations.

Food	*Pounds per man per year*
Cereal Products	329
Potatoes	228
Sugars	125
Dairy Products	
Milk, fluid	183
Cheese and other manufactured milk products	29
Butter	46
Fruits	107
Vegetables	255
Lean Meats and Fish	365
Eggs	46
Beans, Nuts, etc.	11
Fats (except butter)	75
Coffee, tea, spices, flavoring, etc.	17
Total	1,816 lb.

Table III—Annual United States Navy Ration Per Man

Estimated by FOOD INDUSTRIES from the official daily ration allowance of the U.S. Navy. Figures are round-number approximations.

Food	*Pounds per man per year*
Cereal Products	310
Potatoes	228
Sugars	114
Dairy Products	
Milk, fluid	183
Cheese and other manufactured milk products	12
Butter	37
Fruits	228
Vegetables	297
Lean Meats and Fish	456
Eggs	55
Beans, Nuts, etc.	11
Fats (except butter)	37
Coffee, tea, spices, flavoring, etc.	17
Total	1,985 lb.

Table IV—Yearly Food Demand of United States Population

(Based on Table I, and a population of 130,000,000)

Food	*Tons per year*
Cereal Products	14,105,000
Potatoes	10,660,000
Sugars	7,150,000
Dairy Products	
Milk, fluid	21,320,000
Cheese and other manufactured milk products	1,820,000
Butter	1,105,000
Fruits	12,480,000
Vegetables	9,815,000
Lean Meats and Fish	8,580,000
Eggs	1,950,000
Beans, Nuts, etc.	910,000
Fats (except butter)	2,990,000
Coffee, tea, spice, flavoring, etc.	1,105,000
Total	93,990,000

Table V—Yearly Food Demand for Armies of Various Sizes

(Based on Table II)

Food	*Tons for Peace Army of 165,000 men*	*Tons for Army of 1,000,000 men*	*Tons for Army of 4,000,000 men*
Cereal Products	27,143	164,500	658,000
Potatoes	18,810	114,000	456,000
Sugars	10,313	62,500	250,000
Dairy Products			
Milk, fluid	15,098	91,500	366,000
Cheese, etc	2,393	14,500	58,000
Butter	3,795	23,000	92,000
Fruits	8,828	53,500	214,000
Vegetables	21,038	127,500	510,000
Lean Meats and Fish	30,113	182,500	730,000
Eggs	3,795	23,000	92,000
Beans, nuts, etc	908	5,500	22,000
Fats (except butter)	6,188	37,500	150,000
Coffee, etc	1,403	8,500	34,000
Totals	149,725	908,000	3,632,000

Table VI—Yearly Food Demand for Navies of Various Sizes

(Based on Table III)

Food	*Tons for Navy of 100,000 men*	*Tons for Navy of 300,000 men*
Cereal Products	15,500	46,500
Potatoes	11,400	34,200
Sugars	5,700	17,100
Dairy Products		
Milk, fluid	9,150	27,450
Cheese, etc.	600	1,800
Butter	1,850	5,500
Fruit	11,400	34,200
Vegetables	14,850	44,550
Lean Meats and Fish	22,800	68,400
Eggs	2,750	8,250
Beans, nuts, etc.	550	1,650
Fats (except butter	1,850	5,550
Coffee, etc.	850	2,550
Totals	99,250	297,750

tons. The amount of the increase for the Navy would be practically the same under any circumstances, because a navy can only be increased over a relatively long space of time required to build ships. Of course, the shore establishment of the Navy would be increased under war conditions and also many ships would be brought out of retirement while others would be taken into service from the merchant marine. A fair approximation of the food demand of the Navy in war time would be three times the demand in peace time. What this amounts to is shown in Table VI, the figures being expanded from Table III and converted into tons.

IN order to determine what general changes in food demand will occur in time of war, it is necessary to consolidate the information in Tables IV, V and VI. Note that Table IV is the food demand of the whole nation, considered as civilians and neglecting the variations caused by the small peace time Army and Navy establishments. But, if we assume the necessity of a maximum war effort requiring the feeding of a total of 4,300,000 men in uniform, then we have only to feed 125,700,000 with the civilian ration. The comparison between peace and war time needs and the necessary changes in various food quantities are shown in Table VII on this page.

Examination of the figures in Table VII shows that, in war time, consumption of all of the general classes of foods increases, except consumption of milk, cheese and other manufactured milk products, and of fruits, which decrease. The greatest increases are found in meat, butter and vegetables, while eggs, fats and cereal products also show important increases. Only one class, the miscellaneous which includes coffee, tea, chocolate, spices, and similar products, shows no increase.

In addition to these changes in quantities of foods needed, it should be noted that much of the demand for the uniformed services will be in different form than that of the same products as used by the civilian population. For instance, requirements of storage and transport, particularly for overseas forces, will bring about a demand for a large quantity of dehydrated potatoes and other vegetables. Other large quantities of vegetables will be canned, rather than distributed in the raw state as at present. The same sort of changes are in prospect for that part of the fruit demand that goes to Army and Navy uses. Demand for canned, smoked and otherwise preserved meats will increase at the expense of the fresh product. Some of the fluid milk consumption of peace time will be replaced by increased use of evaporated, condensed, or dry milk.

Not only will the forms of food in demand be subject to such changes as these, but there will also be changes in the packaging of some foods. The Army has a general preference for products in small cans (No. 2½ or No. 3) rather than No. 10 or larger. Nevertheless, there will be a substitution of larger containers, in many instances, for some part of the food manufacturers' production. Satisfactory containers for dried vegetables and fruits will need to be developed. Also, other changes are likely to develop under pressure of war time needs.

JUST what these changes may mean to the food manufacturing industries can only be guessed at this time. What is needed is that each food manufacturer who feels that he is at all likely to be called on to produce for the uniformed services in war time should study his plant operations with these possibilities in mind. If this is done, there will be much less confusion should an emergency arise.

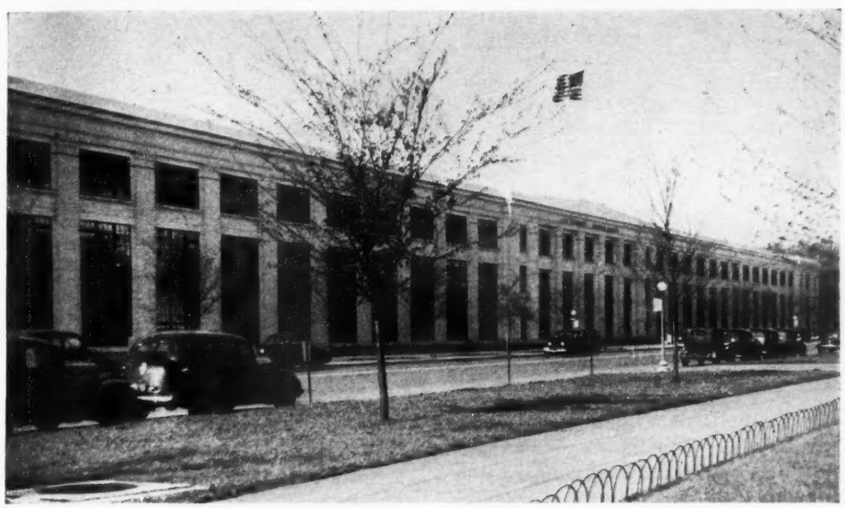
Table VII—Changes in Food Supply Necessary to Feed The United States in Time of War

(Based on Tables I to VI)

Food	Tons Needed for 130,000,000 Civilians	War Time Needs in Tons			Total War Needs in Tons	Change + or −	
		125,700,000 Civilians	Navy of 300,000 men	Army of 4,000,000 men		Tons	%
Cereal Products	14,105,000	13,640,000	46,500	658,000	14,344,500	+239,500	+1.7
Potatoes	10,660,000	10,308,000	34,200	456,000	10,798,200	+138,200	+1.3
Sugars	7,150,000	6,914,000	17,100	250,000	7,181,100	+31,100	+0.4
Dairy Products Milk, fluid	21,320,000	20,616,000	27,450	366,000	21,009,450	−310,550	−1.5
Cheese, etc	1,820,000	1,750,000	1,800	58,000	1,809,800	−11,200	−0.6
Butter	1,105,000	1,069,000	5,550	92,000	1,166,550	+61,550	+5.5
Fruits	12,480,000	12,068,000	34,200	214,000	12,316,200	−163,800	−1.3
Vegetables	9,815,000	9,491,000	44,550	510,000	10,045,550	+230,550	+2.3
Lean Meats and Fish	8,580,000	8,297,000	68,400	730,000	9,095,400	+515,400	+6.0
Eggs	1,950,000	1,886,000	8,250	92,000	1,986,250	+36,250	+1.9
Beans, Nuts, etc	910,000	888,000	1,650	22,000	911,650	+1,650	+0.2
Fats (except butter)	2,990,000	2,891,000	5,550	150,000	3,046,550	+56,550	+1.9
Coffee, etc	1,105,000	1,069,000	2,550	34,000	1,105,550	+550	.....
Totals	93,990,000	90,887,000	297,750	3,632,000	94,816,750	.....	.....

No More Mouths to Be Fed in War Time

But Some Raw Materials May Be Scarce



The Munitions Building in Washington, where planning for the national defense heads up

NATIONAL MORALE demands that the civilian population of the United States be provided with an adequate diet in case of a war emergency. This diet should be changed as little as possible from that to which our people are accustomed under ordinary conditions. To reach this end should be one of the aims of all national planning for war and, in fact, is recognized in the Industrial Mobilization Plan of 1936.

As a first principle, it should be kept in mind that there are no more mouths to feed in war time than in peace, unless the United States should again undertake to supply a part of the food needed by foreign countries. This latter possibility may be put to one side for the moment while consideration is given to the food problem as it concerns the United States alone.

In Table VII, in the preceding article, are shown the changes that might be brought about in demands for food by a war emergency. Even when full allowance is made for the increases that might be needed in the production of certain foods, mere inspection of the table shows that no problem exists as to the supply of raw food materials. Even with all of the natural and artificial restrictions of recent years, by drought and government, American soil still produces exportable surpluses of most foods. Take off the brakes and let the farmers really go out for a record, as was done in 1918, and the raw material supply would certainly exceed all likely domestic demands. Only some now unforeseeable catastrophe could reduce this bountiful reservoir to a dangerously low level.

Of course, there are always certain foods, such as coffee, cocoa, a large part of the sugar and vegetable oil requirements, and spices which must be imported. However, some of these foods are not essential, while for others there are ready substitutes as, for example, corn sugar for cane sugar. In any case, it seems unlikely that ocean transport will be sufficiently disorganized to cause serious breaks in the supplies of essential imported food materials.

The critical point in food supply, should a war emergency occur, will therefore not be found in the supply of raw food stuffs. Where trouble is likely to be experienced is in transportation and processing of food materials. This concerns the movement of raw materials to the manufacturing plant; the availability of labor, equipment, fuel and power for processing foods; and the distribution of foods to the military forces and to the consuming public.

The matter of labor supply and transportation are of great importance and will be considered separately in brief articles of this series.

Distributive mechanisms for food are highly developed in the United States and are entirely adequate to the prompt solution of any problems encountered in peace time. The experiences of 1917 and 1918 demonstrate, however, that these established channels are subject to some dislocation when any major military effort must be made. For example, prices and the cost of living rose rapidly during the World War, bringing considerable hardship to wage-earners. As a result, it was found necessary to institute price controls and other measures to correct the situation. From the general experiences of the World War, the United States has developed an "Industrial Mobilization Plan," to coordinate war time administration and provide a means of meeting problems as they arise, without delay. This plan could be made effective immediately by its enactment into law by Congress. Copies of the plan can be secured from the Superintendent of Documents, Washington, D. C., for 15 cents each.

Referring again to Table VII, it will be noted that around 6 per cent more meat might be consumed in case of a large scale war. It might even be found that the increase would go beyond this, as employment at good wages would then be general and, therefore, the civilian population might increase its meat consumption. Yet the meat supply cannot be rapidly increased because of the necessary

elapsed time before numbers of cattle, hogs and sheep can be built up.

However, the inroads into livestock numbers made by the drought years are now in process of correction. Both cattle and hog numbers are on the increase, as the cycles to which these numbers are subject have turned upward. But it must be kept in mind that there is a definite limit to what can be done, in any short period, toward increasing the meat supply, which might prove to be one of the few food raw materials that would cause trouble in an emergency.

One feature of war time demand for meats is the lessened relative demand for choice cuts that goes with the general increase in meat consumption. Emphasis shifts, as it were, from steak to stew. This means more complete and economical use of livestock supply and should compensate, in part, for increased consumption.

Dairy cattle are another possible source of trouble. Here, again, numbers cannot be rapidly increased. But, in view of the prospective demand shown in Table VII, for fluid milk, butter and manufactured dairy products, the present outlook for the supply of raw milk promises that ample supplies will be available in an emergency. Full utilization in manufactured milk products, particularly to meet a prospective larger demand for canned milk, of the so-called "surplus" milk of the flush season, instead of the present practice of diverting part of this surplus to such industrial products as casein and lactates, would seem to assure an abundant supply of dairy products. It should be recognized that dairy products are already under close regulation. This has created a condition under which any necessary war time regulation of milk supplies would require few additional controls.

Supplies of grains should cause no trouble in a war emergency, in spite of the increased consumption of cereal products indicated in Table VII. Wheat is classified by the Army and Navy Munitions Board as an "essential material not strategic or critical." That means that no procurement problems in war are anticipated for wheat, but that future developments may change its status. However, the supply of wheat, except in case of drought, is mainly dependent upon the acreage planted. And more than sufficient acres for wheat production are available in this country. With other grains, the situation is about the same, and their production could be readily increased.

Fruits and vegetables are also available or can be produced in abundance to meet any foreseeable demand.

The Bureau of Supplies and Accounts of the United States Navy is located in the Navy Building in Washington

Fish supplies are ample, as far as the number of fish in the sea is concerned. However, in a war emergency the problem of availability of fishing boats, and of men to man them, might become serious. This is a point upon which the fishing industry may well ponder. Plans laid in advance to meet such an emergency should prove to be a valuable form of insurance.

Inspection of the group of food raw materials that are wholly or partly imported reveals that shortages of many of these can be met by substitution, as was mentioned in the matter of replacing sucrose with dextrose. This possibility also exists with some of the spices and flavors, for instance, vanillin and coumarin in place of vanilla. Older heads may recall the famous case of "Golden Gate" mustard seed in 1916–17. If food manufacturers study their formulas, they can easily prepare for emergency substitutions of that nature when need arises.

All of the foregoing discussion has been confined to the prospects for feeding the United States during a major emergency. The question still remains as to what would happen if this nation should once again assume the responsibility of shipping great quantities of foods to other nations—quantities that far exceed normal food exports. Nothing very definite can be determined in advance of such an emergency, for the extent of the shipments needed is a matter of pure guess. If the experiences of 1917 and 1918 were to be repeated, the greatest demand on American food supplies would be for cereal products. As has already been noted, grain production in this country can be readily expanded to a considerable extent, as can fruit and vegetable output. Whether or not such shipments would cause a curtailment in supplies for home consumption would largely depend upon the extent of the shipments required and the time of year of the occurrence. Once a crop is planted and growing, little can be done about its increase.

Difficulty would also come with an attempt to ship considerable quantities of meats and dairy products to foreign countries. As already pointed out, increase in numbers of livestock can only occur over a period of years. And the present margin of supply over domestic requirements is not large.

One thing should be kept in mind concerning the possibility of feeding foreign nations in a war emergency. If this is ever done again, it will only be done with control of the seas in the hands of the United States and the countries associated with it. That means that supplies of food raw materials from other high production areas are likely to be available, to eke out our own supplies in doing the feeding job.

How the ARMY and NAVY Buy Food

IN times of peace, purchase of supplies of food and other materials for the Army and Navy is made in the existing competitive market, when the goods desired are available in that market. Such purchases are of two kinds: Large orders, made through purchasing officials, are made by means of competitive bids on a set of specifications, resulting in a purchase contract. Small incidental purchases, made through officers of the units concerned, in regions where purchase through regular channels is not convenient, are made in accordance with the respective regulations of the two services.

Food manufacturers who supply the uniformed services will usually make their sales by the competitive bid method. Therefore, the matter of specifications is of great importance to the food industries. This applies not only with orders for the military services but with all Government purchases.

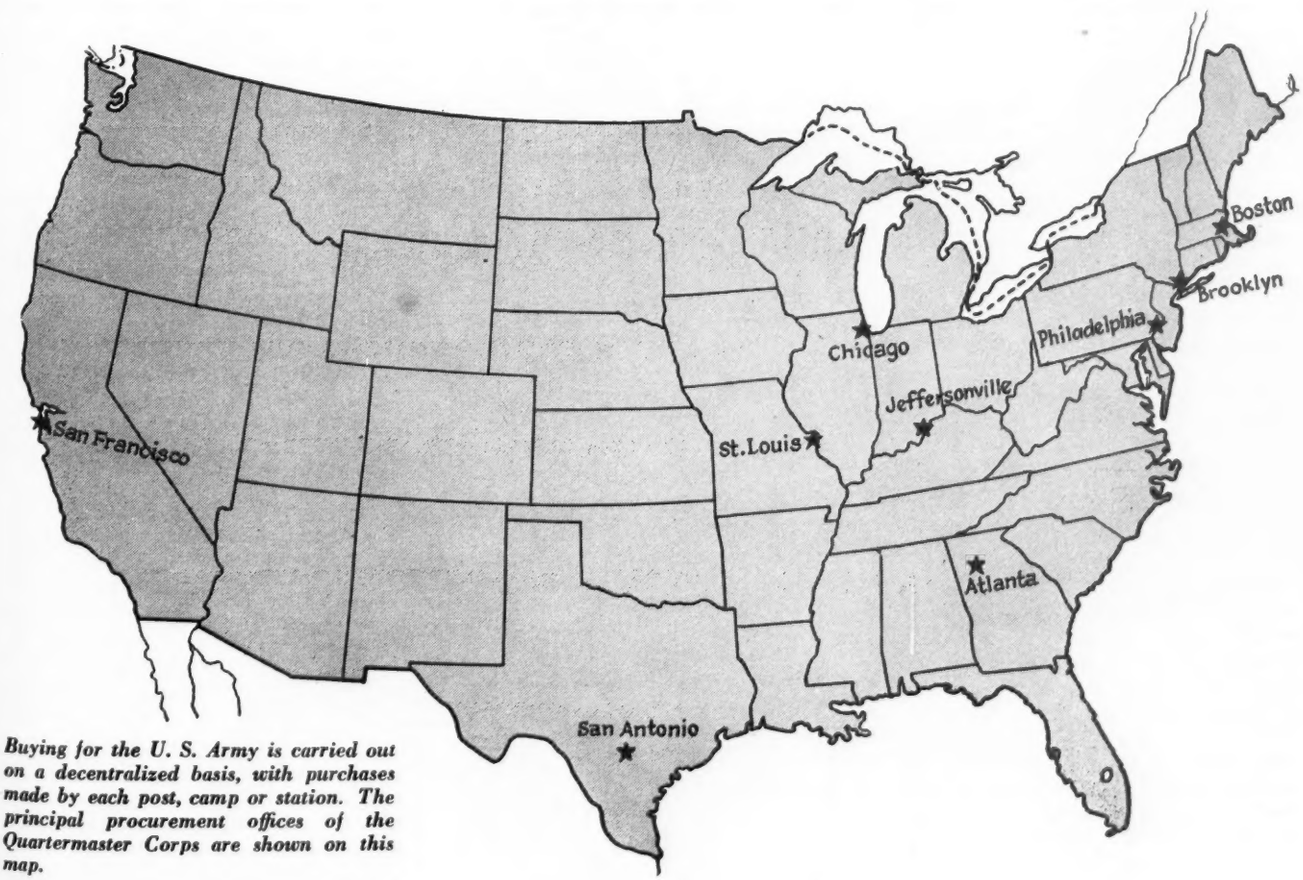
Specifications have been prepared for most articles purchased by the Government and prospective suppliers should familiarize themselves with these specifications. Food manufacturers who make or can make anything likely to be needed by the Army or Navy should procure copies of the specifications which apply. Then they can prepare to manufacture in accordance with these specifications. Army specifications for foods can be secured from the Superintendent of Documents, Washington, D.C. Navy specifications for foods are available through the Bureau of Supplies and Accounts, Navy Department, Washington, D.C. A general index to Federal specifications is for sale by the Superintendent of Documents, Washington, D.C., at 15 cents.

How Purchases Are Made

Both the Army and Navy have established channels of purchase which operate to supply the needs of the peace time establishments. These same methods of purchase will undoubtedly be continued if emergency arises, since the two systems have been worked out through experience as most suited to the varying needs of the two services.

Army purchases, with few exceptions, are made on a decentralized plan. That is, each post, camp or station publishes its own invitations to bid on its requirements and awards are made to the low bidder or bidders meeting all requirements of the bid. The Chicago Quartermaster Depot purchases flour for all stations in the United States except those in Pacific Coast and Western States. This depot contracts for all yeast, yeast food and malt syrup, and canned corn beef and canned corn beef hash.

In war time, it is expected that the Army will continue to utilize the normal distributing system of the food industries, but with a tendency toward



Buying for the U. S. Army is carried out on a decentralized basis, with purchases made by each post, camp or station. The principal procurement offices of the Quartermaster Corps are shown on this map.

centralized purchases on a commodity basis near the center of bulk supply. For example, Chicago would continue to purchase flour and certain canned meats and meat products. Dehydrated fruits would be purchased at two or three different points and the same procedure followed with respect to certain canned or dehydrated vegetables, in order to secure adequate supply and controlled distribution.

Purchases for the U. S. Navy are organized on a centralized basis, with all major transactions carried out through the Bureau of Supplies and Accounts of the Navy Department in Washington. With foods, the staple non-perishables are purchased by this Bureau. Food manufacturers who are to supply these foods to the Navy should arrange to do so by corresponding with this Bureau. Perishable foods are purchased under the direction of the Bureau, but the actual invitations to bid and purchase contracts are made locally through "field purchasing." The manufacturer who is to supply to the Navy foods that fall in this class of perishables, should apply to any of the addresses on the following list, so that his name may be placed on their mailing lists to receive invitations to bid on local purchases.

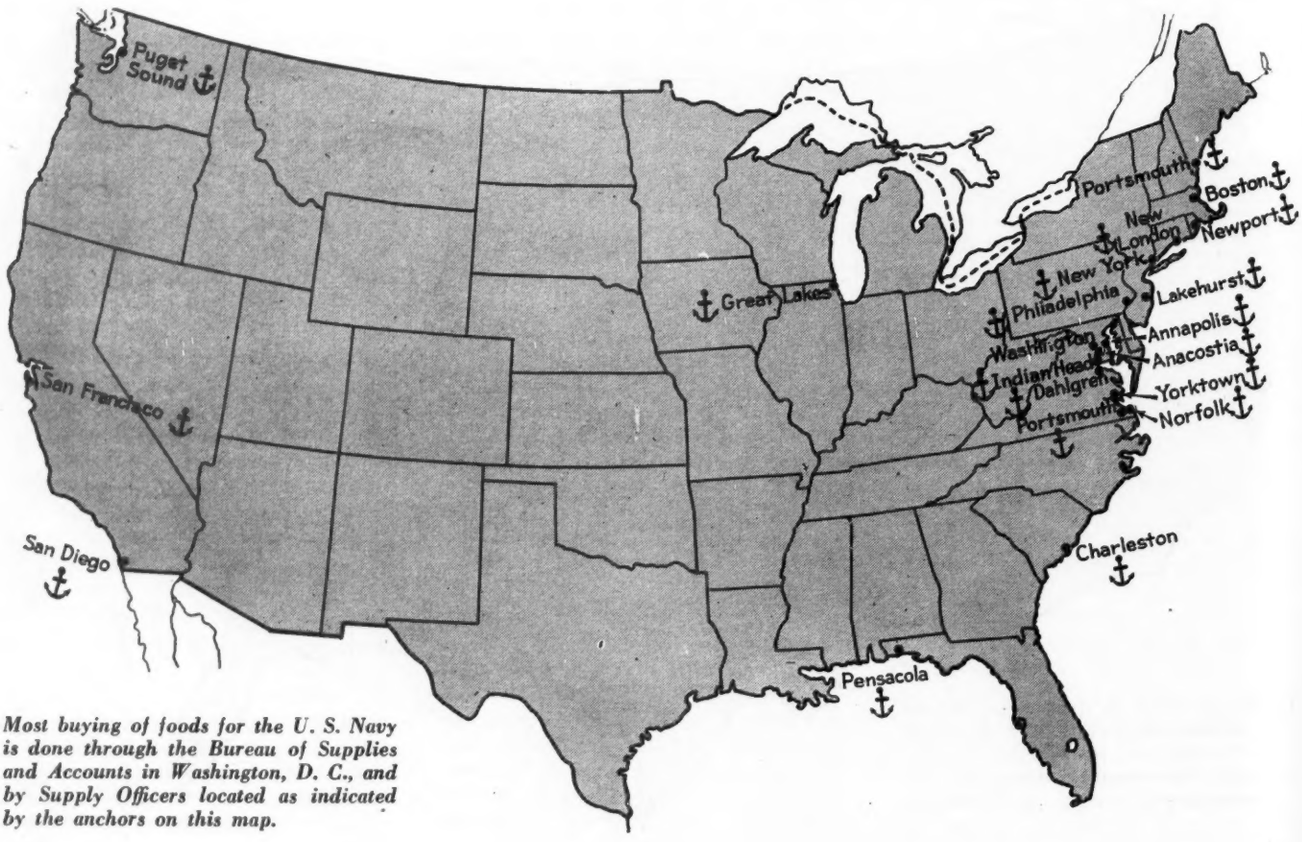
Supply Officer, Navy Yard
Portsmouth, N.H.
Supply Officer, Navy Yard
Boston, Mass.
Supply Officer, Navy Yard
Philadelphia, Pa.
Supply Officer, Navy Yard
Washington, D.C.
Supply Officer, Norfolk Navy Yard
Portsmouth, Va.
Supply Officer, Navy Yard
Charleston, S.C.
Supply Officer, Navy Yard
Puget Sound, Wash.
Supply Officer, Naval Air Station
Pensacola, Fla.
Supply Officer, Naval Air Station North Island—San Diego, Calif.
Supply Officer, Naval Air Station
Lakehurst, N.J.
Supply Officer, Naval Air Station
Anacostia, D.C.
Supply Officer, Naval Powder Factory
Indian Head, Md.
Supply Officer, Naval Proving Ground
Dahlgren, Va.
Supply Officer, Naval Academy
Annapolis, Md.
Supply Officer, Naval Mine Depot
Yorktown, Va.
Supply Officer, Naval Torpedo Station
Newport, R.I.
Supply Officer, Naval Training Station
Great Lakes, Ill.
Supply Officer, Naval Aircraft Factory,
Navy Yard—Philadelphia, Pa.
Supply Officer, Submarine Base
New London, Conn.
Supply Officer, Naval Research Laboratory, Anacostia Station—Washington, D.C.
Officer-in-Charge, Navy Purchasing Office, P.O. Box 9, Sta. C.—New York, N.Y.
Officer-in-Charge, Navy Purchasing Office—San Francisco, Calif.
Officer-in-Charge, Naval Supply Depot,
Naval Operating Base—Norfolk, Va.
Officer-in-Charge, Naval Supply Depot,
Naval Operating Base—San Diego, Calif.

In connection with the Navy purchases of perishables, it should be noted that the Navy buys through invitations to bid, issued by the Supply Officers listed, for periods of one to three months duration. Supply officers of ships in ports where no local contracts exist are permitted to buy only after the issuance of bids and award to the lowest responsible bidder. The monthly or quarterly contracts entered into by Supply Officers of Navy Yards cover the estimated needs of ships that may visit those ports during the contract period. In contrast, contracts entered into by Supply Officers of ships cover definite quantities of foodstuffs needed at the time of the purchase.

How Deliveries Will Be Made

In peace time purchases, both the Army and Navy often buy foods on contracts calling for delivery at the buyer's premises. However, in war time, because of the necessity of expediting shipments, it is probable that purchases will be made f.o.b. manufacturer's plant, as was done in the

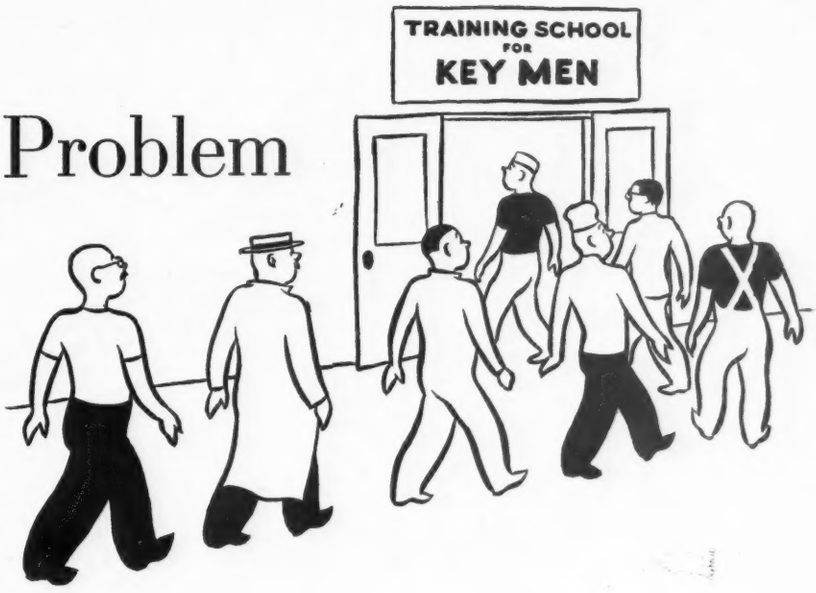
(*Turn to page 318*)



Most buying of foods for the U. S. Navy is done through the Bureau of Supplies and Accounts in Washington, D. C., and by Supply Officers located as indicated by the anchors on this map.

Your "KEY MAN" Problem In a War Emergency

How Will You Meet It?



SHORTAGE of manpower to operate many industries was one of the problems that the United States struggled with during the World War.

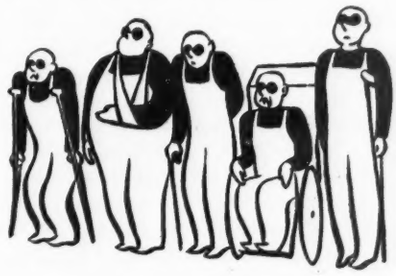
When the United States entered the War in 1917, it had for the previous two years been engaged in a heavy manufacturing program for the supply of munitions, foods and other materials to other countries. From April, 1917, onward, there was added to this already great load, a tremendous flood of orders for the American forces.

Following closely upon the declaration of war, volunteering for Army and Navy service began to remove large numbers of men from the labor market. Then came the selective service law, the so-called "draft." It was the intention of this law to profit by the sad experiences of England and prevent the enlistment of men in the military services from seriously depleting the manpower necessary to operate essential industries at the highest possible level.

Unfortunately, the best of intentions do not always work out in practice. Many who volunteered and some who were drafted, turned out to be key men in the industries where they had worked. Beyond this, the demand for workers was so great that many industries were short-handed and hard-pressed to turn out necessary production.

Because this situation is still fresh in the minds of many food plant managers, there is much question as to what might happen if the country were to become involved in another large-scale war. Of course, it is impossible to answer that question definitely. However, the experiences of the World War have borne fruit and plans have been made for war time controls which would insure the use of the nation's manpower for the best interests of the military forces and of the nation as a whole. The exact nature of the plans, if put into effect, would depend upon legislation enacted by Congress in the event of an emergency. The general plan can be seen in the "Industrial Mobilization Plan, Revised 1936" (for sale by the Superintendent of Documents, Washington, D. C., price 15 cents). It is likely that, if this plan ever needs to be put into effect, provision will be made to exclude from the military services any key men needed to operate food manufacturing industries that are essential for supplying the needs of the military and civilian population.

In spite of all the planning that may be done, it is also likely that the food industries will need to arrange to employ men disqualified for military service by age or physical condition. Also, it is likely that many more women will need to be employed than is at present the case. It should be a relatively simple matter for the management of food manufacturing plants to plan now the steps that would be needed to train and utilize workers from these new sources.

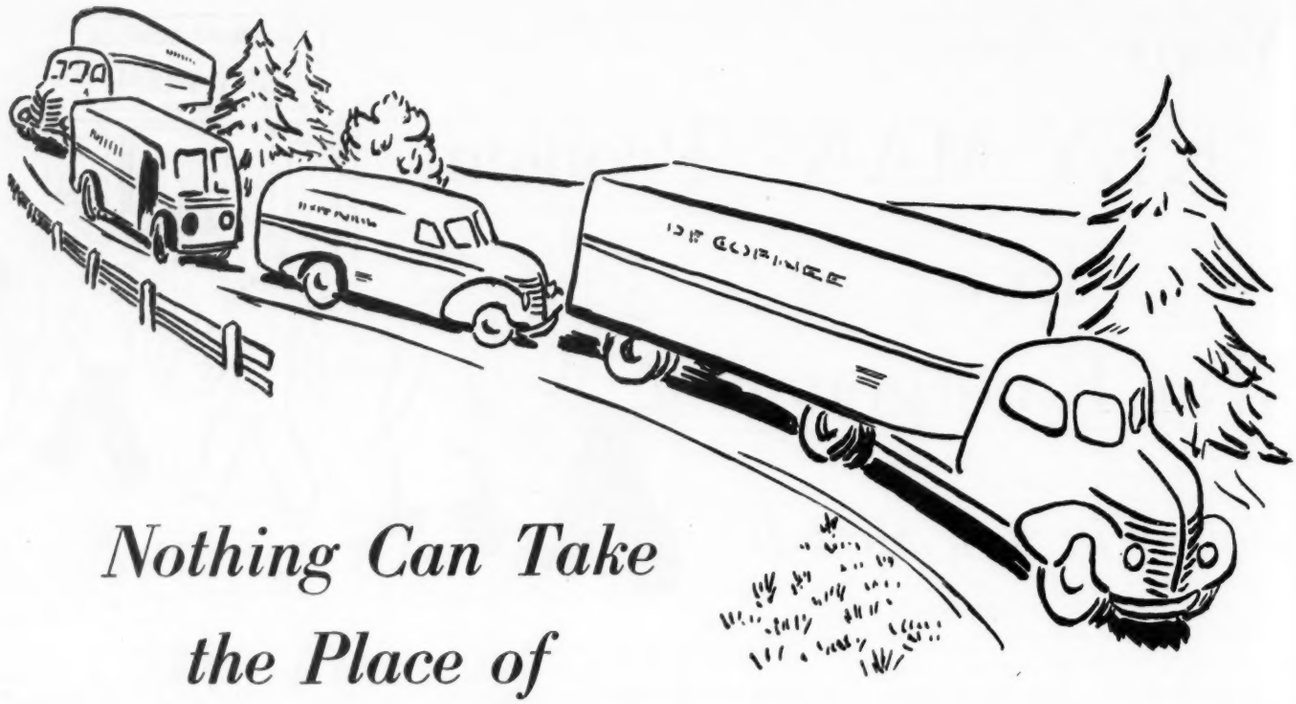


Another important matter for food plant managers to consider well in advance of the actual entrance into any war is the vital matter of training replacements for managerial posts and foremanships. In most cases, such training could safely be postponed until the actual outbreak of war, as the time between then and the date when the draft became effective would be sufficient. Two or three men could be prepared for each position, thus providing a margin of safety that would insure continuity of production. But if such a course is followed, **it would be well for the sake of peaceful industrial relations within the plant, to explain to the whole staff just what is being done and why.**

Personnel problems will also affect the supply of labor for producing food raw material, also for distributing these foods to the manufacturers' plants, and for distributing foods to the consumer.

However, except for the matter of skilled workers and executive help, the present labor situation in the United States indicates no prospective shortage of manpower. No one knows exactly how many men are unemployed at present. Nor does anyone know how many of these unemployed could be used effectively in an emergency. But it is apparently quite unlikely that present unemployment will be much reduced in the next few years. And it is safe to say that the unemployed constitute a great reservoir of unskilled labor that could be

(Turn to page 318)



Nothing Can Take the Place of

YOUR OWN TRUCKS In a War Emergency

ONE of the coldest winters ever recorded in that area clamped its icy jaws on the northeastern part of the United States in the winter of 1917–18. Switches froze everywhere and freight traffic on most of the main arteries of commerce slowed almost to a standstill. The confusion of that period and the measures found necessary to restore order to the transportation system bit deep into the memories of manufacturers of foods and other necessities.

Naturally, when the possibility of war arises again, among the first questions that the manufacturer asks himself are "What will happen to the shipments of raw material and supplies that I must have to keep the plant operating, and how will I ship my products to market?"

Of course, everyone realizes that shipments for the military forces would again have priority over all other freight. That is a necessary war measure. But what about the needs of the civilian population?

Two things should do much to prevent the unreasonable delay of shipments. One of these is the early establishment of a coordinating control over all forms of transportation. The other is the tremendous improvement in highway transportation that has taken place in the past twenty years.

The Industrial Mobilization Plan referred to already in this series of articles, is very likely to be put into operation by Congress, perhaps in modified form, immediately a war emergency arises. This plan provides for the establishment of a War Resources Administration. One of the proposed control divisions of this administration is a transportation division having oversight over rail, highway, water and air transportation. The plan states, "Transportation facilities, including rail, highway, inland waterways, pipelines and airways, will operate under the management of their own leaders, as directed by the Administrator of War Resources".

In the matter of truck transportation, it seems evident that this facility should prove to be a great aid to food manufacturers in both incoming and outgoing shipments. Paved highways now reach every part of the United States. Many food companies already own large fleets of trucks. In fact, the most recent estimates show that American food manufacturers now own and operate a total of close to 600,000 motor trucks. Add to this the great capacity of the automotive industry to produce new trucks and it seems likely that plenty of motor transportation will be available for the food industries if war should come.

However, most of the industry depends upon railroads for long distance hauls and for handling bulk shipments. And it is well known that the present condition of the railroads is not very good and that, if an emergency comes, these poorly-maintained railroads will have a sudden peak load thrown on them by military necessities.

If the time ever comes when war seems imminent, a far-sighted food manufacturer will buy plenty of long-distance trucks as insurance against a possible breakdown of rail transport.

What Would a "WAR LOAD" Mean *to the Food Manufacturer?*

In the first article of this series, in Table VII, were set forth the increases in quantities of broad general classes of food that would probably be necessary to feed this nation in war time. But these figures do not tell the whole story of what the "war load" of the American food manufacturer might be. Nor do they indicate the steps which he might need to take in order to carry this load.

There is that nebulous, speculative possibility that always comes to mind of the necessity of feeding other nations in war time. What that might do to the food manufacturer's load peak cannot even be guessed, because no one knows what the extent of the job might be. What this foreign-feeding load might be, can only be determined if and when the occasion arises. Allowance should be made for this possibility in any plans that are formed, but it would be impractical to take any actual steps in that direction.

Next to add to the "war load" is the probability that food manufacturers may find themselves short-handed in some departments, in particular, those that have to do with the maintenance of equipment.

As a final complication, it will undoubtedly be difficult, in a war emergency, to obtain any new equipment, unless it is definitely for the purpose of producing foods ordered by the military forces. Machines to replace worn out equipment, to step up production or supply more power, or to make possible some new manufacturing process, will be very hard to get. Every machine shop in the nation will be chock-a-block with military business. Even the metal needed for machine construction is likely to be pre-empted for war use.

What, then, can a food manufacturer do now to make his way easier if a war should come?

Three things, apparently, are worth doing. These are:

1. Survey the plant thoroughly, making check sheets showing personnel and equipment as they exist at present and as needed if full-scale, forced production should be required.

The check sheet for personnel should include all workers, listing them as skilled and unskilled and noting the work for which they are required. It should list all foremen,

engineers, technologists and all supervising, managing and administrative personnel needed to operate the plant both now and in case of emergency. This check sheet would serve as a basis for arranging with draft boards and employment services for an adequate staff in cases of emergency.

All equipment should be listed on the equipment check sheets. This would include not only processing equipment, but also conveyors or other handling equipment, pumps, air compressors, pipelines and valves, control equipment, motors, prime movers and generators, and steam raising facilities. An estimate of any additional amounts of electric power, steam and fuel that would be needed in emergency should be part of this check.

2. Replace, now, any equipment that is worn out or completely obsolete. Also check on stock of repair parts and make sure that it is sufficient. This step is advisable because such things are difficult to purchase after the outbreak of a war and are also likely to cost more at that time.

3. Arrange with the sources of supply of equipment so that fabrication of equipment needed to increase capacity, or to install new and necessary processes, can begin at the first definite sign of an emergency. This requires complete frankness with equipment suppliers, so that they can be prepared to supply the necessary apparatus and yet not go to any expense for engineering work, patterns, etc., until it is certain that the supplies will be actually needed.

In addition to these very practical steps that each food manufacturer can take in his own plant, there is another aspect of this matter of war time food supply that deserves his consideration. During the past decade or so, many innovations in the technics of food processing have come to the fore. A number of these have become common practice among food manufacturers. But others are just in the process of becoming accepted as general methods of food processing. Still others are in an introductory or laboratory stage.

Among these processes, many have to do with improved preservation of foods. Freezing of foods for both consumer and institutional use has made rapid strides, but is still not widely adopted. One method of freezing possible for use in quantity supply applies to meats and consists of boning a freshly slaughtered carcass, packaging it under pressure and then freezing it. This method has the advantage of halving the space requirements needed for a given tonnage of meat and at the same time reduces shipping weights by removal of all bones at the packing plant. There is also a saving in having the bones available at a central point for by-product processing. This technic is new, but seems possible of development.

Ordinary methods of quick freezing will probably find more use as refrigerated storage and shipping facilities increase. This process might be extensively used in war time for feeding both civilian and military consumers.

Storage of foods in inert gases such

(Turn to page 318)

How Army and Navy Buy Food

(*Continued from page 314*)

World War. In this way, the priority rights of the Army and Navy will apply to the shipments and the food manufacturer will not be faced with the possibility of delayed shipments and consequent penalties. Where shipments are not made f.o.b. plant, it is probable that reasonable allowance will be made if shipments are made in regular channels at times specified in the purchase contract.

Another point that the food manufacturer should keep in mind is that the Industrial Mobilization Plan (1936 Revision) includes the following: "(Part I, Sec. 1) (c) Due consideration shall be given to the essential needs of the civil population. (d) The least possible disturbance must be caused in the normal economic life of the country. The production load must be intelligently distributed."

What these sentences mean in practice is that the plans of the Army and Navy, in case of a war emergency, contemplate an allocation of the sources of supply of various requirements, including manufactured foods. This will prevent confusion in filling the needs of the Army and Navy, and will assure the availability of supplies for civilians. In no case, it is expected, will the combined purchases of the Army and Navy take more than 50 per cent of the supplier's capacity. This has the added advantage, for the manufacturer, of permitting him to retain most of his regular customers, in spite of the emergency load which he may be required to meet.

In this matter of selling food to the Army and Navy, the food manufacturer who does not already do business with these services, should make contact with the appropriate bureaus, and ascertain the specifications of various products which he can manufacture. Perhaps he already makes these products. If not, it may be that plans can be made so that part of his production can be shifted to wanted products. Certain manufacturers will find that they now make products which are not useful in time of war, but that they can readily shift production to necessary products if a war emergency arises. Those who cooperate with the military services by planning in advance to make such shifts will be able to avoid some dislocation of their business if trouble comes. At the same time, they will be doing a patriotic service for their country.

Your Key Man Problem

(*Continued from page 315*)

of great use to the country in event of war.

It should also be noted that, under present employment conditions, young people who are below military age and who in past years would have been at work now tend to remain in school and are therefore not counted as unemployed. It is also true that many women, older men and well-to-do people, who now do not work because they have no need to, would be available for military and civilian service in emergency.

There is available from these various sources, a great army of people who could fill unskilled or semi-skilled positions were the need to arise. And to them can be added the normal increase in the working population of something near 500,000 workers each year.

Which brings us back to the point that personnel problems in the food field in war time will center about the skilled worker. Men who are competent as food chemists are also useful in ordnance and chemical warfare service. Food men will be needed in the subsistence and medical branches of the service. Engineers and men capable of running a factory effectively can also function to good purpose in administering various military activities.

Therefore, if food manufacturers are to be ready to meet the unusual burdens of war time production, if and when it becomes necessary, thought must be taken in advance, and plans formed to enable them to do so. Also these plans must be revised every year, for we all grow older and pass out of the picture.

It has been jokingly suggested that food plants should be staffed with managers, technologists, engineers and foremen having flat feet and wearing dark glasses. Perhaps that is going too far. Should emergency come, the food plant management will be wise to arrange immediately with the local draft and federal employment authorities for the exemption of the necessary key men and specialists to keep the plant in operation.

What Would a War Load Mean

(*Continued from page 317*)

as CO_2 has been pioneered in England, and is another possibility for war time use.

Dehydration of foods is one of the earliest known methods of preservation, but it is not widely used at present, except for milk, eggs, prunes and certain other fruits. However, dehydration has distinct advantages in reducing both weight and bulk. It is quite likely that dehydration would be widely used by both Army and Navy in case of war, because of these advantages. However, as no extensive industry for dehydration exists, except for the products already mentioned, it would need to be built up from scratch, probably with Government support.

One factor to consider in connection with dehydration is the fact that it can be used more safely now than in times past, because of the knowledge of vitamins that now exists. It is, of course, well known that a diet of dried foods is deficient in certain vitamins and may be a cause of scurvy. The famous British custom of feeding a ration of lime juice to sailors on sailing ships was an early remedy for this trouble. Now, with synthetic vitamins and vitamin concentrates available, it is a simple matter to add enough of these materials to any diet so that vitamin deficiencies can be avoided.

SUBSTITUTION of dextrose for cane sugar has already been mentioned as one of the possible steps that can be taken to compensate for foods now imported, in whole or in part. Another possibility is the production and use of starch from sweet potatoes as a replacement for imported white potato starch. Still other substitutes would include the use of synthetic or domestic-grown flavors and spices for those now imported. These substitutions are not likely, however, to call for the use of much new equipment. What they will mostly require are changes in formulas, rather than changes in manufacturing processes or equipment installations.

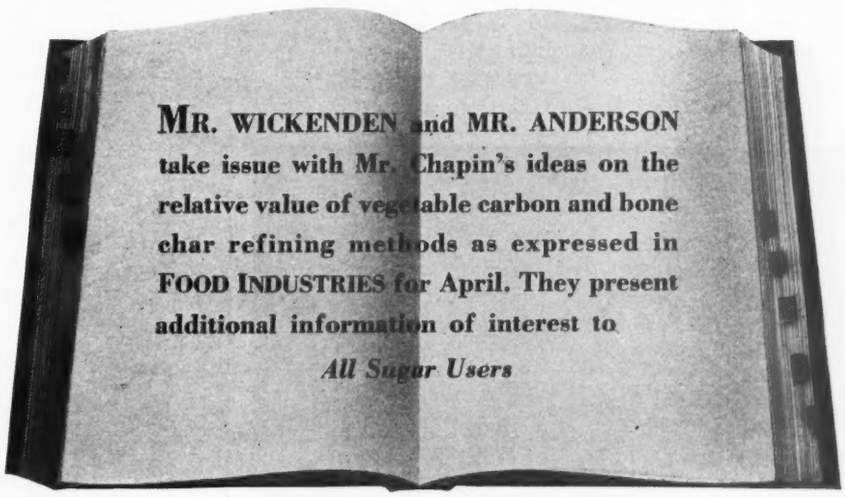
Finally, in these matters of meeting a "war load," the food industries will encounter the need for money. Obviously, until the actual occurrence of a war emergency, financing would continue to be done as at present, through banks and other private agencies. Should war come, the matter of finance would undoubtedly become a matter of Government care. This has been recognized in the Industrial Mobilization Plan, which includes the following statement: "The direction of flow and the furnishing of new capital to the support of those industries on which the welfare of the country most depends must be secured (1) by a system of priorities administered by an agency to be established by the President, and (2) by the creation of a corporation charged with the loan of Government funds." This would seem to forecast financing through an agency like the existing Reconstruction Finance Corporation, and this agency might well form the nucleus of a new endeavor.

Another Angle on
SUGAR REFINING COSTS

Relative merits of vegetable carbon and bone char processes

By **LEONARD WICKENDEN**
Vice-president

and S. W. ANDERSON
Suchar Process Corp., New York, N. Y.


MR. WICKENDEN and MR. ANDERSON take issue with Mr. Chapin's ideas on the relative value of vegetable carbon and bone char refining methods as expressed in FOOD INDUSTRIES for April. They present additional information of interest to
All Sugar Users

ALLEGATIONS with respect to vegetable carbon which have been threshed out long ago are the basis for practically all of the comparisons between the vegetable carbon and bone char methods of refining made by E. E. Chapin in his article, "There's More to Sugar Refining Costs," FOOD INDUSTRIES, April, 1939. These allegations have been covered not only in the technical literature but in the operating results of fifteen or twenty vegetable carbon refineries.

To show the relative advantages of the vegetable carbon process of refining sugar, we are reproducing on an accompanying page a flow sheet of a typical Suchar Process refinery. On this is super-imposed, for comparative purposes, that portion of a bone char refinery of similar size which would be completely replaced by the vegetable carbon[1] equipment. Although it looks rather complex, the comparison is really quite simple. Following the raw sugar which, in either process, is mingled, washed, melted and heated, we find the resulting raw melt treated in the mixing tanks with from 1 to 2 per cent of vegetable carbon based on the solids in solution. This treatment lasts about 20 minutes, during which time the vegetable carbon does all of its refining job. From the mixing tank, the melt containing the vegetable carbon flows to the Auto filters, where the vegetable carbon and any other suspended matter is filtered out rapidly under pressure.

After discharge from the filters, the refined melt is given a final filtration to catch any stray particles of carbon, whereupon it is sent to the vacuum pans and subsequent stages, just as would be the case in a bone char refinery.

Follow now the raw melt as it would go through a bone char refinery. From the heater, the melt would be piped to the "blow ups," where it is mixed with the diatomaceous earth to facilitate "pre-filtration." From the blow ups, the liquor is passed through the pre-filtration filters, whence it goes to the feed tanks for the bone char filters. It will be noted that both blow ups and pre-filtration are omitted if vegetable carbon is used.

The liquor then passes through the huge bone char filters, each of which has been carefully packed with 25 to 30 tons of revivified granular bone char. After about 30 hours, the bone char becomes exhausted and must be "sweetened off" to recover the sugar in the filter, which takes from 6 to 10 hours. This dilute "sweetwater" must then be evaporated in the triple-effect evaporator to recover the sugar, another operation which is not necessary in the vegetable carbon process.

A typical bone char filtration cycle starting with "filling" and proceeding through "settling," "filtration," "sweetening-off," "washing," "air-on" and "emptying" takes from about 70 to about 90 hours, of which, as pointed out above, only about 30 to 35 hours, or roughly 40 per cent, is actual filtration. A bone char refinery must therefore have about 2½ bone char filters to keep one in service continuously.

From the bone char filters, the refined liquor passes through the "liquor gallery" and thence to the pans and other departments as in a vegetable-carbon refinery.

We come now to the important stage of revivification of carbon. The amount of bone char used per 100 lb. of raw sugar refined varies a great deal as between refineries, the limits being about 40 lb. minimum to about 100 lb. maximum, or from 20 to 50 times the amounts of activated vegetable carbon needed. The revivification equipment necessary is, therefore, much larger, bulkier and more expensive, as shown on the flow sheet. It is only necessary to wash vegetable carbon with acid and water, then dry it and heat it electrically, all in specially designed equipment which is quite compact. A not inconsequential item, in comparing the two processes, is the necessity of a bone char inventory of about 40 times the necessary vegetable carbon inventory.

Even a casual glance at the flow sheet will give one a clear idea of the immense saving in equipment space

[1] Where the term "vegetable carbon" is used in this article, the authors are referring more particularly to Suchar. They are associated with the manufacturer of this product and therefore know it better than other vegetable carbons.

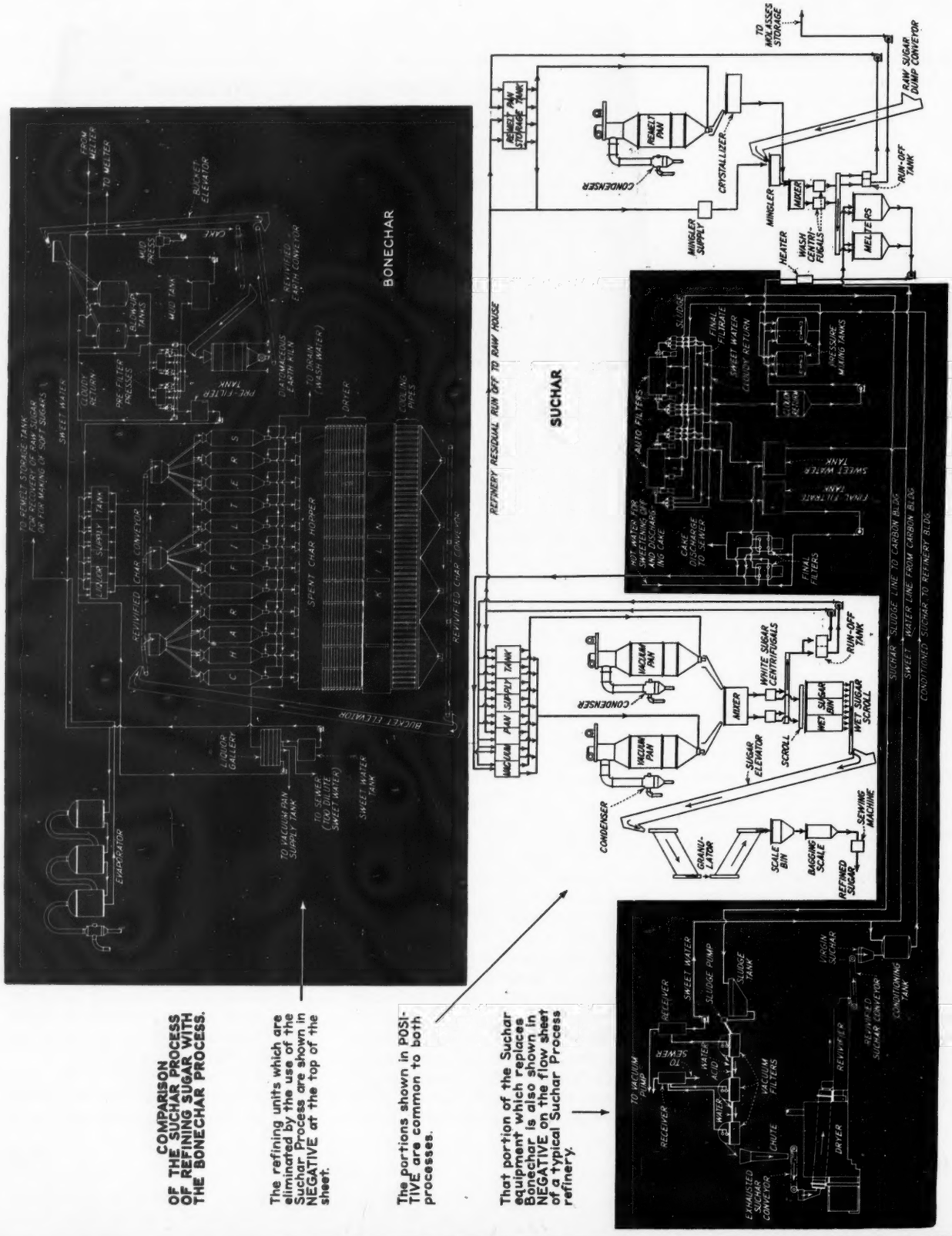
which is possible through the use of activated carbon as compared with bone char. A few years ago we were fortunate to be furnished with an estimate prepared by engineers for a bone char refinery covering the cost of erecting a bone char plant of a daily melting capacity of 250 tons. We prepared estimates for a similar sized vegetable carbon plant at the same location. Including buildings (in this instance, inexpensive tropical type), all equipment, freight from New York and erection, as well as bone char or vegetable carbon inventory, the figures were:

Bone char plant.....$694,000
Vegetable carbon plant.. 342,000

Saving (51 per cent)..$352,000

Similar costs would vary considerably, according to location, but our company's experience in erecting and installing a number of vegetable carbon process refineries throughout the world confirms very closely the figures given above. During the last decade, not a single new bone char refinery has been built, whereas some eighteen to twenty vegetable-carbon refineries have ben constructed.

Incidentally, we think it is significant at this point to quote from the brief of the counsel for Domestic Sugar Refiners presented on Feb. 14, 1933, to the United States Tariff Commission in connection with Investigation No. 66 of that commission, which was concerned with a possible



Flow sheet of typical Suchar Process refinery. On this is superimposed that portion of a bone char refinery (parts with black background) of similar capacity which would be replaced by the vegetable carbon equipment.

revision in the sugar tariff. This brief was prepared after extensive hearings held before the commission during the previous year and represents the views of the domestic bone char refiners. On page 15 we find the following statement:

"We do not need to discuss again, or at least at length, the known differences between the cost of manufacture of the newer operations in Cuba (by which is meant primarily vegetable carbon refineries erected adjacent to raw sugar mills) and the cost of the American refiners. While we do not claim that as yet any of these newer operations may enjoy all the known economies, with increasingly efficient operation they are possible of being realized. We know that when fully realized they will amount to from 34 to 38 cents per hundred pounds, depending upon whether the sugar is made during the grinding season only or throughout the year. We refer to the ample proof offered by us at the April hearing, and to our former brief."

From this we see that the domestic refiners themselves agree that the more modern vegetable carbon refineries erected in Cuba are more economical in operation than bone char plants.

In the following paragraphs we shall take up briefly all of Mr. Chapin's main points and present the well-established answers to them. Mr. Chapin makes three principal points. His first point is a little obscure. He says:

"The first publicized data were based on refining with a high grade raw sugar and after taking out what was readily converted, the residue was turned back to the raw plant at a price for the sugar which it contained at the same price as originally charged. In other words, they bought whole milk and after skimming off the cream sold back the skimmed milk at the whole milk price."

We don't quite know what he means, but for the record let it be stated that any independent vegetable carbon plant operates as does any refinery. It buys raw sugar at a price and refines it. As a refinery, it does not turn back anything to anybody any more than does any of the large bone char refineries.

Mr. Chapin's second point (picked from two different paragraphs) reads as follows:

"When decolorizing carbons are used it is necessary to employ from 1 per cent to 3 per cent on the weight of sugar refined and, while the solution may be decolorized, it is not possible to remove much of the impurities from the solution with that small amount of carbon. This is important, because carbons are so expensive that they can be applied economically only to very pure solutions and this requires that the raw sugar shall be washed in centrifugals and these washings can only be used in recovery of the contained sugar (about 10 per cent of the original raw) by boiling in a vacuum pan and making raw sugar from them again or by partly decolorizing, clarifying and selling at a low price as a sirup which may be slightly better than molasses. The inability of the carbon to remove quantities of impurities above a fraction of its own weight makes it also less easy to exhaust the washed sugar solutions and they too must be boiled up for raw sugar sooner than liquors from bone-char filters."

Mr. Chapin has missed two important facts which previous investigators have almost always pointed out in their preambles. The first is that (according to Blowski and Bon)[2] new bone char contains 9.43 per cent carbon (the balance being largely calcium phosphate). Vegetable carbon, on the other hand, contains about 96 per cent carbon, or a ratio of about 10 to 1. Carbon for carbon, therefore (if there were no other factors to take into account, which there are), 2 per cent of vegetable carbon is equivalent to 20 per cent of bone char.

Secondly, Mr. Chapin does not appear to realize that only the impurities in a raw sugar solution can be the vehicles of color, since sucrose itself is colorless. If he removes the color, he perforce removes the impurities which cause that color, since the color does not have any independent existence. Furthermore, Mr. Chapin's conclusion from his false assumption is contradicted by results obtained in practice. Vegetable carbon plants get just as many "strikes" of refined sugar as a bone char plant. One further point on this subject. A good measurement of the impurity removing and refining power of whatever char or carbon is used in sugar refining is the percentage recovery of refined sugar out of every 100 lb. of raw sugar melted. Mr. Chapin admits that the bone char refiners lose about 7 lb. of raw sugar out of every 100 lb. melted. Based on audited results in several refineries, a normal loss for vegetable carbon is less than 7 per cent, often appreciably less. This could not be the case if the refined liquors had to be reboiled in the remelt station oftener or sooner than is the case with bone char refineries. This also shows that, capacity for capacity, vegetable carbon refineries do not need more centrifugals and pans than a bone char refinery, as Mr. Chapin alleges.

MR. Chapin states his third point as follows:

". . . but the answer is really in the actual cost of treatment. I know a well-managed char refinery which finds the cost of char and its total application to amount to not over 3 cents per 100 lb. of sugar produced. In small units where decolorizing carbon is used, it may be exhausted and thrown away, while in larger units it is customary to install equipment for reactivation. In either case, tanks and filter presses are required and the initial cost of the carbon and the losses during reactivation are comparatively high. The reactivation equipment is quite expensive. It is very apparent that 3 cents can little more than cover the cost of the carbon treatment."

WE find the above quotations so vague in character and so difficult to follow that it is not easy to frame a reply which we can confidently feel will meet the misgivings which apparently exist in Mr. Chapin's mind. As far as the carbon costs are concerned, we also can quote a well managed Suchar Process refinery in which the entire cost of the revivification of the carbon, including depreciation on carbon house and its equipment and all other costs, plus the cost of replacing the cyclical physical losses of vegetable carbon, amounted to *less* than 3 cents per 100 lb. of refined sugar produced. This figure is based on an independent audited report which we would be glad to show to anyone with accredited motives. It may be appropriate to point out in this connection that in his sworn testimony before the Senate Finance Committee on Feb. 26, 1934, the manager of one of the large bone char refineries in the United States presented figures covering the costs of bone char processing during the year 1933. These figures, including the replacement of the bone char, totaled $0.04975 per 100 lb. of sugar melted, which is substantially higher than the figure mentioned above.[3] As far as actual costs of operation in this particular department are concerned, therefore, it would seem clear that a vegetable carbon refinery is at no disadvantage in comparison with a bone char refinery.

With regard to the cost of reactivating equipment, the term "quite expensive" is so vague as to be practically meaningless. No doubt Mr. Chapin would readily agree that the large kilns used for reactivating bone char are also "quite expensive." If, however, we consider for the sake of argument a 500-ton sugar refinery, it would seem to be beyond argument that the buildings and equipment needed for reactivating from 7.5 to 10 tons of vegetable carbon a day must be less costly than the buildings and equipment necessary for revivifying 200 to 400 tons of bone char a day.

[2] Decolorizing Carbons, by A. A. Blowski and J. H. Bon, California & Hawaiian Sugar Refining Co., Crockett, Calif., presented before the Division of Sugar Chemistry at the 70th Meeting of the American Chemical Society, Los Angeles, Calif., Aug. 3-8, 1925.

[3] "Hearings before the Committee on Finance, U. S. Senate, 73d. Congress, 2d Session, on S. 2732, Feb. 23, 24 and 26, 1934," page 223. Government Printing Office, Washington, D. C.

Adapts Standard Truck To Frozen Food Delivery

At Saving in Cost

Dairy converts streamlined panel body to dry ice refrigerator

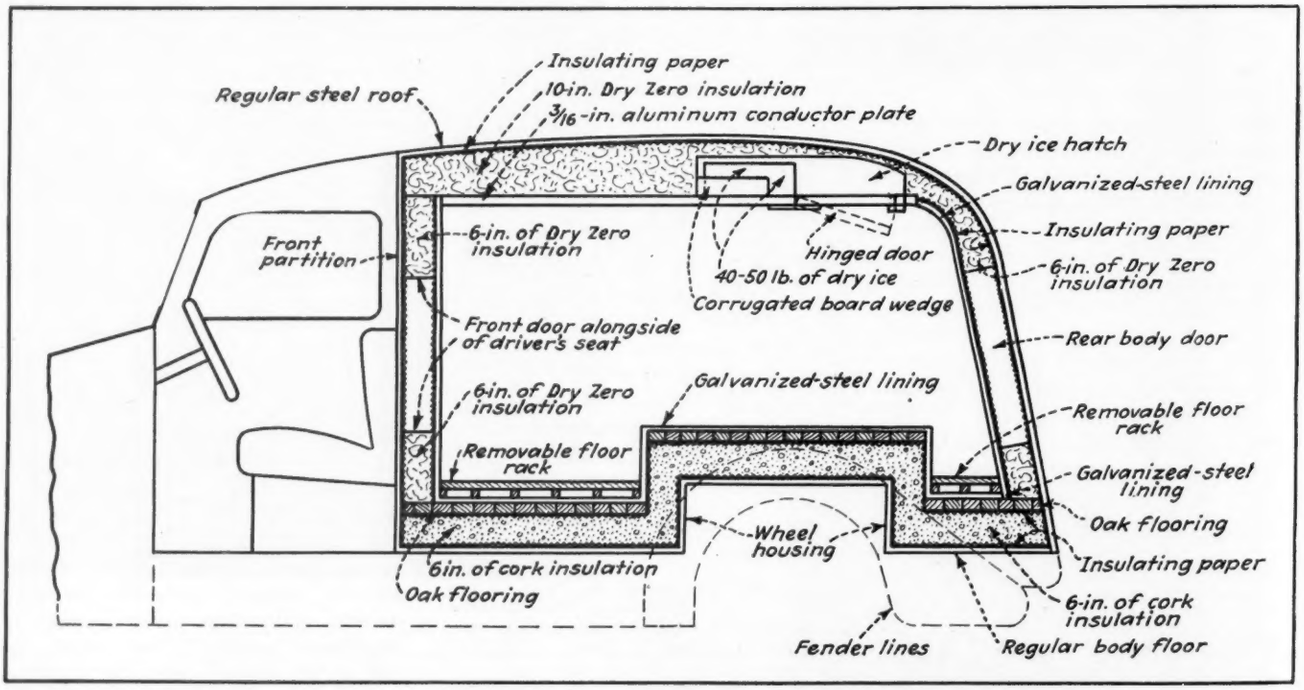
IT was an attractive low-cost truck that Quaker Dairies, Inc., Detroit, wanted for retail delivery of frozen foods. So the company selected a standard 1-ton truck with a panel body and had it equipped with insulation. It did not choose a truck chassis and mount on it a specially designed insulated body. And in addition to low cost and good appearance, the dairy obtained, in the converted standard panel chassis, light weight, simplicity of construction and ready adaptability.

As shown in the accompanying illustrations, the unit selected is a standard Ford chassis. All of the necessary insulation is fitted entirely inside of the standard panel body. To all outside appearances the vehicle is just another one of the streamlined, sleek-looking 1939 light delivery vehicles such as might be used by a high-class florist, department store or haberdasher. However, with its inside insulation and provision for refrigeration, it is more nearly a streamlined ice box on wheels.

Dry ice is used as a refrigerant. With a daily consumption of from 40 to 50 lb. of the solid CO_2, Birds Eye Frosted Foods are maintained at a temperature below 10 deg. F. The products carried include fruits, poultry, vegetables, meats and sea foods, these being packed in cartons of various sizes.

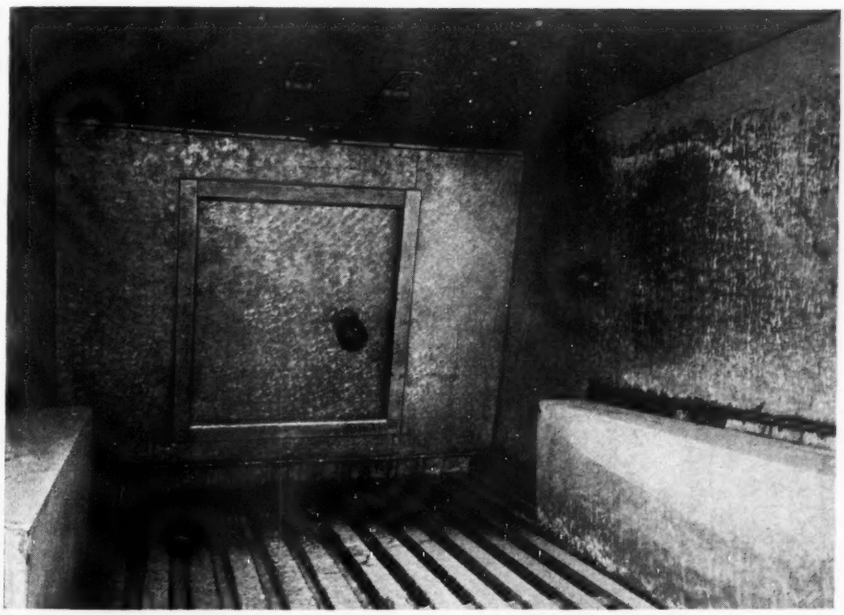
The conversion of the standard Ford panel body into the insulated and refrigerated body as shown in the accompanying cross-sectional view cost $390, before the Michigan sales tax was applied. The work was done by National Body Corp., Detroit.

Both cork and light-weight Dry Zero are used for insulation. The floor of the body is insulated with 6 in. of cork, protected both top and bottom with special insulating paper. On top of the upper layer of paper over the cork floor is laid a protecting oak flooring. Above this is a surface of galvanized steel, sealed water-tight on the floor itself and where it joins with the vertical inside walls and ends of the body. Over this steel flooring are carried removable wooden racks. These serve to protect the flooring itself and to provide an air space below the bottoms of the frozen food cartons loaded directly on the racks. The air space serves the dual purpose of providing free circulation of cooling air



Cross-sectional view of the converted Ford 1-ton panel body as used by Quaker Dairies, Inc., Detroit, for distribution of Birds Eye Frosted Foods to retail stores. Dry ice, carried in a bunker built into the roof insulation as shown, is utilized to maintain the body temperature below 10 deg. F. to keep the frozen food in good condition.

Low first cost and attractive appearance were two of the most important factors which led to the choice of a converted standard panel body in place of a specially designed refrigerated body mounted on a conventional truck chassis. While to all outside appearances the truck is a typical delivery unit, the built-in insulation and dry ice refrigeration make it an ice box on wheels.



This view is taken looking toward the rear of the body and shows the removable wooden racks on the floor, the steel-covered wheel boxes on the side, the steel side wall and rear-end lining, the rear refrigerator door, the aluminum ceiling conductor plate and the hinged door through which dry ice is inserted in the bunker built in the roof insulation.

Food DISTRIBUTION

and keeping the cartons off the floor. Cartons coming in contact with the floor would be discolored if moisture were present.

The side, end-wall and roof insulation follow the inside contours of the standard panel body. Side and end-wall insulation are made up of 6 in. of Dry Zero protected on both sides by insulating paper and on the inside by the same galvanized steel sheeting as used on the floor.

The original rear doors of the body were removed and the rear of the body rebuilt into an insulating wall with a regular refrigerator door in the center. A partition is built crosswise of the body directly in back of the driver's seat with a similar refrigerator door next to the driver. These two doors permit the driver to assemble his deliveries from either the front or rear of the body, whichever is most convenient.

The roof insulation is similar to that of the side and end walls except that it is made up of 10 in. of Dry Zero and the inside ceiling is not of galvanized steel but a single plate of aluminum $\frac{1}{8}$ in. thick.

The bunker for the dry ice refrigerant is built into the roof insulation just inside the rear door, as shown in the accompanying cross-sectional view. This bunker has a hinged drop-door through which it is filled with dry ice from inside the body.

When the dry ice is placed in the bunker, it rests directly upon the upper surface of the aluminum plate. The latter serves as a conductor to distribute the cooling effect evenly over the entire ceiling area of the body.

The dry ice is prevented from sliding around in its bunker when the truck starts and stops by the use of corrugated-board wedges between the block of refrigerant and one of the side walls of the bunker.

How to Use Lactic Acid

In Finishing Pickles and Pickle Products

What it costs. Other uses of lactic acid in foods

Part II

By

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and

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THE comparative cost of using vinegar alone and combinations of vinegar and lactic acid in finishing pickles will, of course, vary with the current market prices. At the time this was written, 100-grain white distilled vinegar in carload lots was quoted at 9 cents per gallon. Assuming a specific gravity of 1.016, a gallon would weigh 8.46 lb. At 9 cents per gallon, this would cost 1.064 cents per pound or, on the basis of grains per pound, the cost would be 0.01064 cent per grain-pound.

Assuming a specific gravity of 1.014 for 50-grain cider vinegar, a gallon would weigh 8.44 lb. With cider vinegar quoted at 11.5 cents per gallon for 50-grain stock, the price per pound would be 1.363 cents, and the cost per grain-pound would be 0.02726 cent.

Lactic acid testing 50 per cent and having a specific gravity of 1.12 was recently quoted at 11 cents per pound. Lactic acid testing 500 grains at 11 cents per pound would cost 0.022 cent per grain-pound.

A summary of the cost of the three different types of acid preservatives would be as follows:

White distilled vinegar	= 0.01064 cent per grain-lb.
Lactic acid	= 0.02200 cent per grain-lb.
Cider vinegar	= 0.02726 cent per grain-lb.

With these figures the comparative costs can be closely approximated. For illustration, the cost of the materials in Examples 1, 2, 3, 4 and 5 were calculated to show some comparative costs.

Example 1

Cost of combination of distilled vinegar and lactic acid:

112.5 gal. of 110-grain distilled vinegar	=$11.14
34.4 lb. of 50-per cent lactic acid	= 3.78
Total cost of combination	=$14.92
Cost of 125 gal. of 110-grain distilled vinegar	=$12.37
Difference in cost of combination	= $2.55

Example 2

Cost of combination of cider vinegar and lactic acid:

63.1 gal. of 52-grain cider vinegar	=$7.55
11.79 lb. of 50-per cent lactic acid	= 1.30
Total cost of combination	=$8.85
Cost of 75 gal. of 50-grain cider vinegar	=$8.62
Difference in cost	=$0.23

Example 3

Cost of combination of cider vinegar and lactic acid:

150 gal. of 40-grain cider vinegar	=$13.80
50.18 lb. of 50-per cent lactic acid	= 5.52
Total cost of combination	=$19.32
Cost of 200 gal. of 40-grain cider vinegar	=$18.40
Difference in cost of combination	=$ 0.92

Example 4

Cost of combination of distilled vinegar and lactic acid:

615.6 lb. of 108-grain, by weight (110-grain by vol.), distilled vinegar	=$7.20
22.18 lb. of 50-grain lactic acid	= 2.44
Total cost of combination	= 9.64
750 lb. of 98.5-grain, by weight (100-grain by vol.), distilled vinegar	=$7.98
Difference in cost of combination	=$1.66

Example 5

Cost of combination of cider vinegar and lactic acid:

421.3 lb. of 51.4-grain (52-grain by volume) cider vinegar	=$5.98
9.29 lb. of 50-per cent lactic acid	= 1.02
Total cost of combination	=$7.00
500 lb. of 49.5-grain (50-grain by volume) cider vinegar	=$6.82
Difference in cost of combination	=$0.18

From the foregoing examples, it is evident that a combination of distilled vinegar and lactic acid is more expensive than distilled vinegar alone. The difference in price is not great, however, and is not proportional to the difference in the improvement in flavor when lactic acid is added. There is practically no difference between the cost of a combination of cider vinegar plus lactic acid and cider vinegar alone, due to the "grain-pound" cost of cider vinegar (0.02726 cent) which is approximately one- and two-thirds times that of distilled vinegar (0.0164 cent).

Increased Use of Lactic Acid

Through the courtesy of the U. S. Chamber of Commerce the following information was obtained on the use of lactic acid in Germany. The quotation is from a report of the U. S. Consulate General at Frankfort-on-Main, Germany.

"Almost the entire amount of lactic acid produced in Germany is made from potato starch. Accurate data on the volume of output are not available. Lactic acid has been gaining steadily for the last five years in Germany, part at the expense of citric and tartaric acids, in preserving and flavoring uses. It is now used in large volume in lemonades, essences, extracts, fruit juices and sirups. All of the German outputs of pectin, which amounted in 1935 to 7,223 metric tons, and of jellifying extracts, placed at 9,228 tons, contain lactic acid as a preservative. Lactic acid is also used as preservative in canned vegetables and fish.

"Germany exports considerable quantities of lactic acid and lactate, whereas the corresponding imports are small.

German Exports of Lactic Acid and Lactate

Year	*Metric Tons*	*1,000 Marks*
1934	1,345	1,298
1933	1,547	1,703
1935	1,278	1,001
1936 (9 months)	649	572

"In 1935 German lactic acid and lactates went, in small quantities, to 27 different countries. The principal destinations are shown below:

Countries of Destination	*Exports in Metric Tons*
Canada	154
Netherlands	119
Great Britain	115
Belgium	100
Poland	74
Switzerland	74
United States	84
Other countries	558
Total	1,278

Other Uses of Lactic Acid

In addition to its use in lemonades, essences, extracts, fruit juices and sirups, lactic acid is also being used in canned vegetables, olives and fish. More recently it has been used in the curing of meat. Hans J. Jerne of Wasstnaar, Netherlands, was granted a British patent (No. 474,905), Dec. 9, 1937, for an improved treatment for curing pork. The pork may be cured by brine immersion, brine injection or dry salting, but uses lactic acid as an aid to the spices in the proportion of 0.1 per cent lactic acid. A suitable pickling composition may be somewhat like the following:

Pickling Composition

Salt	330 lb.
Saltpeter	33 lb.
Sugar	33 lb.
Suitable preservative	33 lb.
Lactic acid	1/3 lb.
Water	158 gal.

Of the two lactic acids available, the sarcolactic acid from meat is preferable to the ordinary lactic acid from milk, according to the Jerne patent.

The addition of acids such as acetic and lactic to food products such as vegetables, fish and meat to prevent putrefaction is a very wise and desirable procedure. It will save a great deal of spoilage in this type of food whose reaction is so near the neutral point as to permit the growth of putrefactive bacteria. Fabian and Johnson[3] showed that the presence of 0.2 per cent acetic acid or 0.3 per cent lactic (calculated as acetic acid) was sufficient to inhibit the growth of *Bacillus mesentericus fuscus,* an organism causing softening of pickles.

In conclusion, it would seem that lactic acid has been overlooked as a valuable addition to the acid preservatives that may be added to food products. Lactic acid forms the first line of defense against putrefaction and other undesirable fermentations in such foods as milk, butter, cheese, sauerkraut, genuine dill pickles and many others. It improves the flavor, is physiologically harmless in the proportions used, and is actually beneficial since it is readily utilized by the body as a food. Doubtless it will find a more extensive use in the food processing industries.

Acknowledgement —The authors wish to express their appreciation to R. G. Switzer for his assistance in helping with the formulas and the calculations.

References

1. Fabian, F. W., and Wadsworth, C. K. Experimental work on lactic acid in preserving pickles and pickle products. (Unpublished at this time.)
2. Fabian, F. W., and Wickerham, L. J. Experimental Work on Cucumber Fermentation. Part VIII, Genuine Dill Pickles. A bilogical and bacteriological study of the curing process. Mich. Agr. Exp. Station, *Tech. Bull.* 146, 1935.
3. Fabian, F. W., and Johnson, E. A. Experimental Work on Cucumber Fermentation. Parts IX-XII. A bacteriological, zymological, histological and chemical study of the spoilage of pickles. Mich. Agr. Exp. Station, *Tech. Bull.* 157.
4. Wadsworth, C. K. A Comparison of Acetic and Lactic Acids for Finishing Pickles and Pickle products. Pickle and Kraut Packers Conference. *Fruit Products Journal* 16, 209–11, 214, 217, 240–243, 1937.

These Food Plants *Cut Operating Costs*

Surprising savings made by eliminating waste in getting steam, power compressed air, water or refrigeration to processes

By CHESTER R. EARLE
Engineer, Republic Flow Meters Co., Chicago, Ill.

▶ ***Waste and excess costs often go unnoticed in food plants because the management is ignorant of the amounts of steam and power being distributed to different departments and processes. It is one thing to generate steam and power economically and another to utilize it efficiently. This article tells how steam and power distribution losses may be detected and what savings result. It is of practical value to***

All Food Manufacturers

Part II

NO MATTER how much you cut costs of steam and power generation, you may completely offset these economies by permitting waste in getting the steam and power to your processes. The savings that usually show up largest and soonest are those you can make in your boiler room. These are often spectacular, whereas the economies resulting from analysis of distribution and utilization often consist of an accumulation of small items, none very impressive by itself, but reaching a surprising total. Consequently, after you have seen what can be done in your steam and power generating equipment, the large savings you can make there will lead you to understand more fully the possibilities of savings in the processes.

For example, you have been told of the old trick by which the engineers supply 10 lb. steam to a boiling kettle instead of the 100 lb. demanded by the process operator, putting a steam gage on the line calibrated 10 to 1 so it will read 100 lb. Since the steam is required here only to boil the water at atmospheric pressure, 10 lb. steam will do as well as 100. This 10 lb. steam may be available as exhaust steam, thus releasing 100 lb. steam in just the right amount for some other process in which the pressure, as well as the temperature, may be important. This is a comparatively small matter, yet it is from such details that large savings accumulate. Therefore, analyze the distribution and utilization of your power services item by item, just as you did generation. You will be agreeably surprised.

To make this analysis, however, you must have at least a few measuring instruments—flow meters, thermometers, pressure recorders for steam, water, brine and the like, as well as ammeters and voltmeters for the electrical circuits.

Steam and water valves and electrical connections supply raw materials for your processes. You would not allow your workmen to draw all the raw materials they need from the stockroom without keeping a record of them. Why then allow the workmen to draw steam from valves without knowing how much they take? Even though the steam costs only 25 or 30 cents per 1,000 lb., you cannot afford to waste it. In a certain plant, meters installed to measure high- and low-pressure steam to process units made possible savings of $1,500 a year through reduction of steam consumed. The meters cost $975.

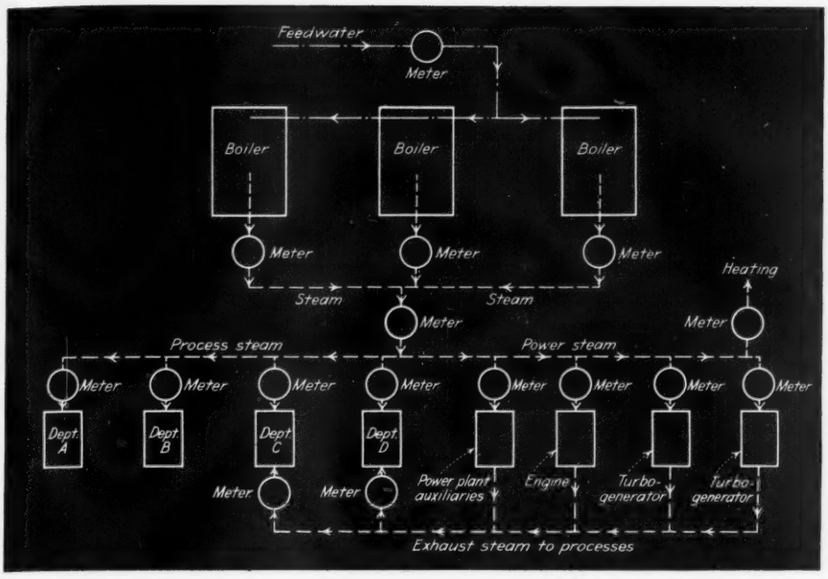
In steam and water lines, the pressure and temperature for which they were designed must be maintained, otherwise their capacity will be affected. Sometimes, if the piping has sufficient strength, more steam or water can be sent through a given pipe by increasing the pressure, within limits. Obstruction of piping by various types of scale formation may reduce its capacity over a period of years. The remedy, replacement or scale removal, will depend on cost analyses. In some cases where large pipes carry solutions containing suspended matter, deposits can be prevented by a "go-devil" sent through the pipe at suitable intervals. Glass piping for certain liquids is coming into greater use in process and distribution work.

The treatment, handling and utilization of water form one of the most important services with which the food plant executive is concerned. If you are prorating filtered or treated water to departments or processes, can you know that they are not using more or less than the prorated amounts, thus affecting unit process costs? Your total water cost, may remain the same but your unit production costs may change. Water for washing and cooking and for any process use must be clean and pure, involving water softening, filtering, pumping and the like. All these processes add a certain value to the water and demand some method of accounting for this value.

By way of an example of unknown water costs, consider the case of the mill supplying filtered water at a flat rate of $400 per year. This mill installed a flow meter in the filtered-water line, established a rate of 8 cents per 1,000 gal., and the first month's bill was $1,000. The user reduced the amount of water consumed and for successive months the bills averaged $680 per month.

When meters are used, various special technics can be employed to cut costs. In one large plant, distribution meters are checked by a meter supervisor, who looks for variations. To establish an approximately correct normal from which variations can be judged, a red circle is drawn on each chart. So long as the quantity does not vary from this by more than a reasonable average, conditions are satisfactory. But wide variations are immediately investigated. For instance, a certain washing process requires hot water, and if this water gets too hot, the steam chart for the heater will show it. Sometimes the cause of this is a sticking float valve in the water heater that allows hot water to flow to the sewer. Or it may be cold water flowing to the heater instead of hot water, requiring extra steam.

In one process, this same plant formerly used exhaust steam in open boiling kettles. Several boilings and mixings of residues with water were



Flow meter installation in industrial plant which not only provides a complete record of operations but supplies power service cost data for accurate determination of unit costs. Meters measure flow of feed water to boilers, flow of steam from boilers and amount of steam supplied to each power unit, to each process department and to the heating system. Exhaust steam used in processing is also metered.

necessary. After analyzing the process, it was found that the initial temperatures did not need to be raised so high and that warm water from other processes, previously thrown away, could be fed to the kettles. The result was a decrease in steam consumption from 250,000 lb. per day to 15,000 lb. per day—less than 10 per cent of the former figure. The same sort of analysis decreased the steam consumption of another process from 350,000 lb. per day to 35,000 lb. per day. Also, by studying steam and water flow meter records, it was found possible to shut down a triple-effect evaporator completely and draw liquor of the same strength from one of the intermediate stages of a quadruple-effect evaporator. This change saved approximately 100,000 lb. of steam per day.

An old grain dryer in a certain food plant was to be discarded because it took so long to dry the grain that it was no longer profitable. A steam flow meter was installed on the steam line to this dryer, and the steam consumption was found to be 26 lb. per pound of grain instead of the 7 lb. for which the dryer was designed. Investigation showed scaled heating coils. When the scale was removed, the steam consumption dropped to 7 lb. and the dryer functioned as well as when originally installed. Another dryer, consuming 4 lb. of steam per pound of product as measured by a flow meter instead of the 3 lb. for which the unit was designed was investigated. It was found that operators were failing to close valves to unused drying units, thus wasting steam. This fault was sufficiently great and the resulting saving in steam was enough to pay for the entire installation of meters for that particular plant.

A battery of vats required the contents to be brought up to boiling temperature in a specified time and held there for several hours by steam injected directly into the vats. A flow meter was installed on one vat for a test; it showed a variation of 50 per cent in what were intended to be identical cycles. This was caused by hand regulation of the steam valves, the differences not being detectable because the vats had covers and vent stacks and a quarter turn of the valves was not considered important. The direct loss in steam was about 120,000 lb. per day, not to mention that the excess condensate was found to be detrimental to the product. By using flow meters on all vats, this loss was eliminated.

Monthly Steam and Power Distribution Report Used in Unit Cost Calculations

	Totals		Totals per 1,000 bu.		Totals per 10,000 lb. D.S. corn		Remarks
	Total	Main plant	Total	Main plant	Total	Main plant	
Grind							
Tons coal							
B.h.p. hours							
Kw. hours							
Raw water							
Filt. water							

Item	Department	Basis	Lb. live steam	Lb. exh. steam	Power Kw.-hr.	Gal. raw water	Gal. filt. water	Lb. product	Remarks
1	Raw water	100,000 gal							
2	Filtered water	100,000 gal							
3	Fire protection	Total							
4	Mech. shops & laboratory	Total							
5	Wet starch system	10,000# D.S. Corn Gr.							
6	Table house	10,000# D.S. starch							
7	Germ system	10,000# D.S. germ							
8	Feed system	10,000# feed-coml.							
9	Steep water system	10,000# D.S.S. wtr.							
10	Feed packing	10,000# feed-coml.							
11	Refinery C.S.U. made	10,000# C.S.U.D.S.							
12	C.S.U. filling barrels	Total							
13	Cleaning steel drums	Total							
14	Cleaning C.S.U. tank cars	Total							
15	C.S.U. filling tank cars	Total							
16	Starch refinery	10,000# D.S. starch							
17	Refinery converting sugar made	10,000# D.S. sugar							
18	70 & 80 sugar house	10,000# coml. sugar							
19	Vacuum dried pearl starch	10,000# coml. starch							
20	Bulk pearl, bldg. #19	10,000# coml. starch							
21	Powdered starch	10,000# coml. starch							
22	Kiln dried pearl	10,000# coml. starch							
23	Starch packing	10,000# coml. starch							
	Specialties								
24	Oil extraction	10,000# oil							
25	Gluten meal	10,000# coml. meal							
26	Sweetened feeds	10,000# feed							
27	Oil refinery	10,000# oil							
28	Oil canning	Total							
29	Syrup house	10,000# syrup							
30	Blackstrap & C.S.U. storage	Total							
31	Crystal sugar	10,000# coml. sugar							
32	Douglas gum	10,000# gum							
33	Special 110 starch	10,000# starch							
34	Special moulding starch	10,000# starch							
35	Spec. thin boiling starch W.W.	10,000# T.B. starch							
36	Converting thin boil. starch	10,000# T.B. starch							
37	Clearsol modified starch	10,000# Cl. starch							
38	General offices	Total							
39	Idle time	Tons coal							
	Exhaust blown away	Tons coal							
	Live blown into exhaust	Tons coal							
	Tons of coal to specialities	Tons coal							

A private steam plant was selling steam at a flat rate of $50 to $75 a month to two small food plants. When metered, it was found that this charge should be nearer $250 a month. The cost of the meter was repaid in less than two months.

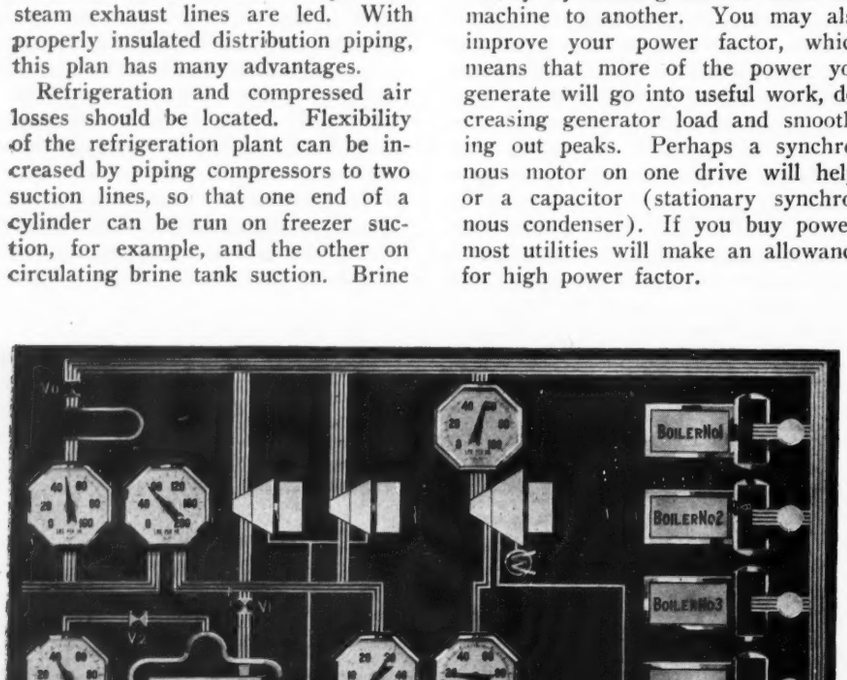
Case after case can be cited in which the amount of steam sold on a flat rate basis has been proved by flow meters to be three or four times the amount assumed. Hence, if your process departments are to figure their costs accurately, as you wish them to do with their other supplies and materials, their steam supply should be measured.

The same is true of water. Flow meters on process water lines will indicate trouble in heaters and filters and pumps. You will often find that pumps are not supplying their designed quantity of water. Pumps for hot water must be properly connected and watched closely to prevent steam binding and overheating. In many cases, some sort of automatic bypass arrangement will be justified to prevent this. Water for process work is heated by many food plants in a centralized heater, to which various clean condensate returns and low-pressure steam exhaust lines are led. With properly insulated distribution piping, this plan has many advantages.

Refrigeration and compressed air losses should be located. Flexibility of the refrigeration plant can be increased by piping compressors to two suction lines, so that one end of a cylinder can be run on freezer suction, for example, and the other on circulating brine tank suction. Brine meters on brine distribution lines will indicate losses in just the same way as steam and water meters. The compressed air problems of tight lines and valves, of supply to various departments, and of process consumption can be solved by similar intelligent use of instruments.

Water for refrigeration condensers, compressed air cooling and the like must be cool enough. If you have cold well water or river water available, you have little trouble. But if you have to pay anything for water for these purposes—pumping costs, for example—flow meters on the lines will help keep those costs down by showing just what you are doing. If you have to cool your condenser or refrigeration water by means of a cooling tower, by all means meter it.

Although somewhat outside the scope of this discussion, mention should be made of electrical equipment. See that the proper types of motors drive your equipment and that they are of correct sizes for the work. Don't let a 50-hp. motor run along at 25 hp., or a 25-hp. motor try to carry 35 hp. You can often improve your electrical conditions enormously merely by shifting motors from one machine to another. You may also improve your power factor, which means that more of the power you generate will go into useful work, decreasing generator load and smoothing out peaks. Perhaps a synchronous motor on one drive will help, or a capacitor (stationary synchronous condenser). If you buy power, most utilities will make an allowance for high power factor.



Diagrammatic instrument panel showing location of flow meters in relation to boilers, turbines and other equipment. This aids the operator in visualizing flows of steam to the processes and in coordinating them with boiler and turbine operation. Note use of accumulator in this layout.

In the processes themselves, a great deal can be done to cut costs by proper utilization of steam, power, refrigeration and compressed air. Many food plants, for example, use evaporators for various processes, and these lend themselves particularly well to automatic control, which smooths out their operation and decreases steam consumption. In various types of evaporators, regulation of level is important, and this can best be done by automatic liquid level control. In other cases, control of steam supply is important. In one salt plant, flash steam from a battery of salt pans is supplied to another battery with make-up steam supplied from a 15-lb. steam line, the whole under automatic control. Complete equipment of indicating and recording flow meters shows the conditions in these evaporators at all times.

It is now possible to place repeated cyclical operations under complete automatic control so that predetermined pressures, temperatures and flows will be maintained for predetermined periods, in proper sequence and under identical conditions, to produce a uniform product.

Many food products plants keep detailed records of power plant service employed in the processes, a typical record of this type being shown in the table. In this plant, an ideal cost figure for maximum and minimum rates of production has been established as a basis of comparison. Many of the units operate on exhaust steam, with automatic reducing valves to provide supplementary live steam, all these lines being metered. Proper control of steam to feed and germ dryers, to avoid heating excess air, is obtained by use of meters. Filtered water to the corn sirup department, where wet starch is hydrolized, must be completely evaporated. Measurements of this water not only gives cost data but also aids operation.

As has been indicated above, the things you can do to reduce costs in distribution and utilization of your power services depend on your willingness to investigate your present conditions, with the aid of suitable instruments. Once you have done that, the ingenuity of your own staff will develop the methods needed to lower the costs. Next, proper application of instruments to distribution and process lines will continuously show the facts about costs. When your department heads find that these records show the processes charged with power services just as with raw materials and labor, they will automatically cooperate to keep them at a minimum.

Protecting Your Legal Liability Under the New Food Law

What every food manufacturer should know before he signs any guarantees to buyers[1]

THE new Federal Food, Drug and Cosmetic Act, which becomes effective on June 25, 1939, differs from the existing law in that it authorizes certain specific guarantees which may be given by the seller to the buyer. As suggested in the Association's Explanatory Bulletin of Aug. 1, 1938, it was deemed desirable that a standard form of federal law guarantee be developed and approved for recommendation by the Joint Conference Committee of Canners and Distributors. It will be recalled that this Joint Conference Committee has authority to make recommendations, but of course cannot bind every member of the participating associations. A suggested form of guarantee was prepared and presented to this Committee at the Chicago Convention. The Committee agreed, in principle, upon the provisions to be embodied in the guarantee, and authorized counsel of the participating associations to study the guarantee presented to the Committee and prepare a form embodying the principles agreed upon. This study has been completed and the form of guarantee recommended by the National-American Wholesale Grocers Association, United States Wholesale Grocers Association, Cooperative Food Distributors of America, Super Market Institute, Inc., and the National Food Brokers Association.

In presenting this recommended form of guarantee to the industry, it seems desirable to review once again the canner's responsibility under the new federal law as shipper, the statutory purpose for which the guarantee is given, the meaning of its various clauses and the reasons underlying each, and the desirability of not including any different or broader forms of guarantee in canners' sales contracts.

Canner's Primary Responsibility Under the Federal Food, Drug and Cosmetic Act

It will be recalled that any food product alleged to be adulterated or misbranded and which is offered for movement in interstate commerce, or which has actually moved in interstate commerce, may be directly proceeded against by seizure action. The seizure action is what is known as an *in rem* proceeding directed against the merchandise itself. In addition, there may be criminal prosecution of any person who violates the law. The prohibited acts include the introduction or delivery for introduction into interstate commerce of any adulterated or misbranded food [Sec. 301 (a)], the adulteration or misbranding of any food in interstate commerce [Sec. 301 (b)], the receipt of any such food in interstate commerce and the introduction of any food produced in violation of the Emergency Permit section of the law [Sec. 301 (d)]. (See Association's Explanatory Bulletin, pp. 25-28, 34-35, for the details of seizure action, trial, release of goods and penalties.)

As the person who introduces canned foods into interstate commerce, the canner is primarily responsible if such food is found to be adulterated or misbranded. It makes no difference whether the product bears the canner's label or buyer's label, whether title has or has not passed to the buyer, or whether by the terms of the sales contract the buyer or seller has undertaken to save the other party harmless. The canner alone is answerable under the law as shipper. (Indeed, even where a canner assembles products of others for shipment in a pooled car, there is the technical possibility of penal responsibility if any of the products in the pooled shipment turn out to be adulterated or misbranded.) The controlling fact is shipment, not ownership.

▶ Manufacturers are authorized to make guarantees to food buyers under the new food law. Some buyers seize this opportunity to try to force the manufacturer to guarantee far more than is his real responsibility. The problem is an old one, dating back to 1906, but it comes up anew in 1939. Here's the way National Canners Association has worked it out in conference with distributors. Before you sign any guarantees, you should study this legal opinion. Its principles apply to the interstate business of

All Food Manufacturers

Purpose of Giving a Guarantee

These prohibitions against delivery or receipt of adulterated or misbranded foods apply equally to the buyer. But Sec. 303 (c) of the statute provides that a buyer shall not be prosecuted under certain conditions. First, he is relieved from penalty for *receiving* an adulterated or misbranded food if he furnishes to the Secretary the name and address of the seller and copies of all documents relating to delivery. Obviously, a sales contract containing a guarantee clause is readily available as evidence of the seller's name and address, and together with the bill of lading would afford complete exemption from prosecution for the receipt of adulterated or misbranded goods.

Second, the Act exempts from prosecution for *shipping* in interstate commerce any person who

"establishes a guaranty or undertaking signed by, and containing the name and address of, the person residing in the United States from whom he received in good faith the article, to the effect, in case of an alleged violation of Sec. 301 (a), that such article is not adulterated or misbranded, within the meaning of this Act, designating this Act, or to the effect, in case of an alleged violation of Sec. 301 (d), that such article is not an article which may not, under the provisions of Sec. 404 or 505, be introduced into interstate commerce."

Thus the primary purpose of the guarantee in the sales contract is to afford to the buyer exemption from prosecution for subsequent shipment of the goods purchased.

It should be observed that the statute requires that the guarantee refer specifically to certain sections of

(*Turn to page 355*)

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More Mistakes To Avoid in Packaging

PART IV

EDITOR'S NOTE: ***This series will run for several months until it is complete.***

EVERY EXAMPLE is based on actual errors of packaging. Publication of the negative aspects of packaging is frequently more informative than the mere statement of a bunch of rules to follow. Particularly is it important to bring out the reasons why, and the automatic penalties that develop because of making mistakes.

155 **Printer Needs Inspiration**—The design of a product often is improved when the merchandiser attempts to have some preconceived idea of what design he wants rather than leave it up to the printer. Although the printer is generally able to produce a usable idea, he is much benefited by having as many suggestions supplied to him as possible.

156 **Reclosure Feature Absent**—Sometimes a package that can be reclosed is important. A food item was being merchandised in a printed carton. The item could be readily poured from a spout, but to save a small amount of money it was decided to use an ordinary closure with perforations that could be punched out to permit pouring the contents, instead of incorporating a pouring spout that could be reclosed.

It so happened that this product was used in the deep South where bugs and vermin are occasionally a problem. The manufacturer had to abandon the carton before the supply he had ordered was half used up because of complaints received that bugs and vermin got at the product. All because the carton could not be reclosed after being opened.

157 **Visibility Has Limtiations**—A great many manufacturers, particularly food manufacturers, have worshipped the fetish of product visibility as the dominating factor in their packaging. A case in point is the manufacturer of a new type of non-fattening macaroni having a different base material from the orthodox macaronis, but nowhere near the starch content. Following the general trend, this manufacturer used printed transparent bags only to receive continued complaints on the score that his product appeared dirty, that the bag slit and broke in transit, and that they were difficult to display under ordinary conditions in the retail store. Because of the different vegetable base that he uses, his macaroni has a slightly greenish cast. Nevertheless, when his macaroni is cooked, it has a whiteness which very closely approximates other regulation products of this class.

The big difficulty in this particular case was that the manufacturer did not think through on his packaging problem. Looking at it from the viewpoint of the consumer, there was nothing appealing or appetizing in the appearance of his greenish macaroni. It is only in terms of its being cooked with cheese, tomatoes, etc., and presented in its ready-to-be-eaten form, that it possesses any appetite appeal. This manufacturer, therefore, has discontinued the use of transparent bags or window cartons, and is correcting the situation through the use of folding boxes which portray the product in terms that will open purse-strings because of its appetizing quality appeal.

158 **Windowless Window Carton Troubles**—A manufacturer of flavoring extracts suddenly decided to use "windowless" window cartons with only a $\frac{1}{4}$ in. margin between the window and the vertical score line. Several million cartons were ordered after the copy had been approved, but in production it was found that "cut-scoring" was necessary to prevent an unsightly flaring of the carton face.

Moral: Be sure your supplier has a background of experience before large commitments are made on a new package.

159 **Sifting May Cause Short Weight**—A packer of free flowing powdered product found that the net weight of the contents of packages varied considerably at point of sale even though all were as indicated by label at time of filling.

The folds of the top of an inner liner bag were interleaved in the pasted top flaps of the cardboard carton. Since the inner surfaces of the bag top were not pasted together sifting out of contents took place during handling and shipping of the package; a perfect job of flap pasting was not possible.

The sifting was stopped and the net weight of contents kept uniform by folding or crimping of the bag tops before the carton flaps were folded and pasted.

160 **Grease-Proof Liner Needed**—A cereal product containing about 15 per cent of fat was packed in cardboard cartons lined with waxed paper. The fat in the product attacked by solution the wax of the paper, penetrated it, and began to be absorbed into the cardboard carton walls. This had two effects: (1) It produced an unsightly condition on the inside of the carton; (2) it robbed the product of part of its fat content. But these were by far the least of the disadvantages. The fat that was absorbed into the cardboard turned rancid, even though the fat under ordinary conditions was highly resistant to rancidity.

The cause of the rancidity here was either the exposure of thin layers of fat to oxidation, or a catalytic influence of some component of the cardboard; perhaps most factors were operative. The odor and taste of rancidity, of course, soon was absorbed into the product itself, which was rendered inedible. This unfortunate condition developed slowly. From six months to a year of storage under ordinary shelf

conditions were required before the final rancid state of the product was reached.

The solution of this packaging mistake was quick and complete, once it was detected. A carton having a greaseproof coating over its inside surface was substituted for the ordinary carton, and the absorption of the fat was stopped entirely. The product now has a shelf-life of at least two years.

161 **Dampness Made Varnish Tacky**—Several million cartons were supplied by a manufacturer who had always previously made them successfully. During the prolonged rain and humid weather of the summer of 1938, these cartons stuck together in large blocks. Investigation disclosed that the carton-maker had switched to a new type of varnish entirely on his own responsibility.

These cartons were sticky and unfit for use under conditions of extreme dampness. Nothing could be done with them except to return to the manufacturer. Even when they had been dried out they were of too poor an appearance to warrant using.

162 **A Whale of a Resealing Job**—To rewrap 6,000,000 packages is a big job. After four months of steady production for warehouse purposes, it was discovered the outer wrappers were literally falling from the package due to uncontrolled and faulty glue dilutions. Several thousand dollars were spent in resealing 6,000,000 packages. This expense could have been avoided had the existing laboratory been charged with the job of controlling adhesive mixtures and the observation of sample packages.

163 **Pies Need Breathing Packages**—A concern baking bread, cake and pies decided to adopt a new form of packaging for popular priced pies. Accordingly, a machine was purchased, specifically designed to handle a highly moisture-proof heat-sealing wrapper. A few days of production developed an excessive amount of mold on the pies, necessitating a costly redesign of the machine to handle a "breathing" type of wrapping material, although this information could have been obtained readily from any wrapping material supplier or from other concerns who have packaged their pies in a similar manner for many years.

164 **Label Had No Gluing Lap**—Manufacturer of a line of 5¢ confectionery specialties wanted to put a new item on the market through jobber and syndicate channels.

Hand and tasting samples were made. Production and packaging costs were carefully calculated and rechecked to assure a profit, although a relatively narrow one, for a new item. An attractive three-color label was worked out.

The jobber and syndicate trade jumped eagerly for the item and placed good-sized orders for as prompt delivery as possible. Several million of the labels were contracted for to get advantage of quantity price and the order was to run off immediately upon approval of sample. Special express delivery was to be made of first ten thousand off the press, to permit operation of labeling machine until freight shipment of remainder could be received.

Factory production of the item began, and a supply of filled containers were on hand, ready to go to shipping department as soon as labeled and packed in cartons.

The special delivery lot of labels was received as per schedule, and sent directly to the forelady in charge of the wrapping department. Almost immediately a trouble call went to the production superintendent because labels would not work on a wrapping machine which required use of quick setting adhesive.

The background of the art work on the label was black and no gluing lap on end of label had been provided. The black ink would not permit penetration by adhesive used on the wrapping machine.

The only way the labels could be made to stick at lap was to use another type of adhesive. But the labeling had to be done by hand and the lap kept under pressure for at least 30 minutes!

Long distance phone call to label printer revealed that remainder of lot had been shipped.

When the label sample had come in for checking and approval, the purchasing department had referred it to sales and advertising departments who checked only on the art work. Production department did not see label until first shipment was received.

New lot of labels with a gluing lap had to be run off at confectionery manufacturer's expense. Until new lot was received hand labeling was done at such increased production expense that new item netted the company a loss instead of profit until the cost of the first lot of labels could be written off.

165 **Higher Speed Made Trouble**—A wrapping material had been used for years with perfect satisfaction on an automatic wrapping machine. Suddenly the paper-maker was notified that his wrapping material was unsatisfactory. Investigation disclosed that a new wrapping machine had been installed without notifying the paper manufacturer. The new machine operated at 50 per cent higher speed. All that was needed was the heavier weight of the same stock to withstand tearing under the greater stresses of faster operation. One should never make any changes without notifying all interested parties.

166 **Wrong Type of Can**—In at least two instances which have been personally observed, canned animal food, one dog food and the other red squill rat bait, was being, canned in general line tin cans rather than in the heavier packers' cans. Because of the very light weight metal, this resulted in distortion of the cans during processing and in considerable spoilage.

167 **Beer Bottles for High Carbonation**—The use of the light-weight beer bottle for beverages carrying a much higher carbonation is always to be avoided. In a money-saving mood, certain bottlers have been known to buy up used or second-hand light-weight beer bottles of the type brought out to meet competition of the metal can. Most of these bottles are intended for only one trip, while others are made purposely very light to meet the can on a weight basis. In all cases the bottles have been engineered nominally to meet the rather low carbonation and internal pressures found in beer. This feature of the bottle engineering is aided by the fact that beer is not often allowed to get extremely warm because the public recognizes beer as being more sensitive to

heat than many soft drinks. With the higher internal pressures, plus the bruises they get in going through the usual junk yard, they are not very satisfactory for use in the carbonated beverage trade and they may give serious trouble.

168 **No Inspection of Re-Use Containers**—In one instance numerous complaints were received from customers that the product was being received in dirty containers. It was found that the trouble arose from the fact that the containers were being used more than once, and that the various customers frequently used them for holding many different materials than those for which they were designed. Some of these other materials could not be removed by the cleaning methods used. The trouble was eliminated by carefully inspecting each container as it came from the washing machine and getting rid of those which could not be cleaned.

169 **Failed to Wash Cans Before Cooking**—Careless filling of meat cans in a foreign plant resulted in badly stained exteriors that were unpleasant to look upon. The cans could not be sold. The trouble arose from oil and fat on the outside of the can. Under the high temperatures of the retorts and the long time of the sterilizing process, the oily matter seemed to scorch or blacken the tin plate.

Part of the remedy for such a condition is greater care in filling. Needed also is a suitable hot water washing spray on the exteriors of the cans after they are sealed. This should be used prior to sterilizing.

170 **Impractical Bag Shape**—A long, narrow bag with a small opening is impractical for machine filling. Perhaps a long, narrow bag may have its advantages for merchandising purposes, but the gains from this angle are many times dissipated by the higher packaging cost. The reason is that materials clog in the filling spout. Also, the opening of such bags in the machine is difficult. Production efficiency may be reduced as much as 75 per cent by this shape of bag. Packagers should also consider the size of pieces when designing containers.

171 **Foil Labels Bring Washer Problems**—Certain curious difficulties are brought about by a change in the type of label for re-use glass containers. Many manufacturers, especially beverage manufacturers, desiring the additional dressiness of the metallic foil overlay type of labels, have found after starting the new operation that their soakers were inadequate to meet the load when it came to washing the bottles. To soak off these new labels, the solution in the washer must actually dissolve off the aluminum foil to get at the underlying glue. This is necessary because the sidewise wetting action is so slow as to be out of the question in the mechanical washer.

To make such a dissolution of the aluminum requires temperatures of about 150 deg. F. and a much higher caustic concentration than is customarily used. These requisite conditions are almost impossible to obtain in the smaller mechanical washers. This comes about because of their small size and such high temperatures (which are unusual and not incorporated in the design) creates a great tendency to break the glassware by thermal shock. Hence, many of the manufacturers who have used the new type of label have had to resort to manual stripping before the washing operation; or the use of very small spots of glue to hold the label onto the bottle; or in some cases have had to abandon the label entirely. In the larger sizes of multiple-compartment type of bottle washing machinery, this trouble has not been so severe because here the requisite conditions of temperature and concentration can be met without injury to the bottles.

172 **Improper Opening of Barrels**—When barrels are to be filled through the head, this fact should be noted on the order to the barrel manufacturer in order that the correct chime can be made on the barrel to facilitate easy removal of the head.

The head hoops should first be loosened before taking the head out. Then the barrel is filled. A frequent mistake is made at this time by failure to make suitable marks on the head and on the barrel so that when reinserting the head it will be placed in its proper original position.

Before taking the head out, chalk marks should be placed, on say four points, on the barrel and head. Then when the head is replaced with the chalk marks in their identical positions, the head fits in exactly into its original position. The reason for all this is that when the head is first placed in the barrel, the pressure of the tightening of the head and hoops results in a "set" position that should be maintained when the barrel is opened and the head is afterward replaced. Otherwise there may be some leakage which an inexperienced packer may not know how to correct.

Hoops should be tightened and tested with a hammer and driver to be sure that they are tight. Many times the inexperienced packer will endeavor to take the head out of a barrel without loosening the hoops, and the consequence is that the head is broken. This necessitates a new head, and additional expense that is needless.

173 **Failed to Give All the Facts**—A manufacturer purchased a capping machine and submitted a certain size of can as being the one to be capped. Also he stated that a certain definite amount of liquid was to be contained in the can at the time of capping. When the capping machine came to be installed, it was found that instead of putting a definite quantity of liquid in the can, leaving a definite head-space, it was filled "right up to the nozzle." It was almost impossible to feed this can at the high rate of speed without spilling. If this fact had been known in advance, provision could have been made to prevent the difficulty.

174 **Special Glues For Varnish**—In a great many cases, manufacturers have been using a suitable adhesive for covering a cardboard box with a varnished paper wrap. But trouble has always occurred where they have endeavored to paste a varnished label to the varnished paper wrap with the same glue. In the first instance, the ordinary type of glue is found satisfactory, because the unvarnished side of the wrap is glued to the plain board surface. But, when the label is added, the plain side of the label must be glued to the varnished face of the wrap. In the latter case it is, of course, necessary to use an adhesive containing a solvent for vanish. Which may cause objectionable odors and flavors.

(To be continued)

Your Package *Can Build or Tear Down* Good Public Relations

Part II

By IVAN C. MILLER
Distribution Editor, FOOD INDUSTRIES

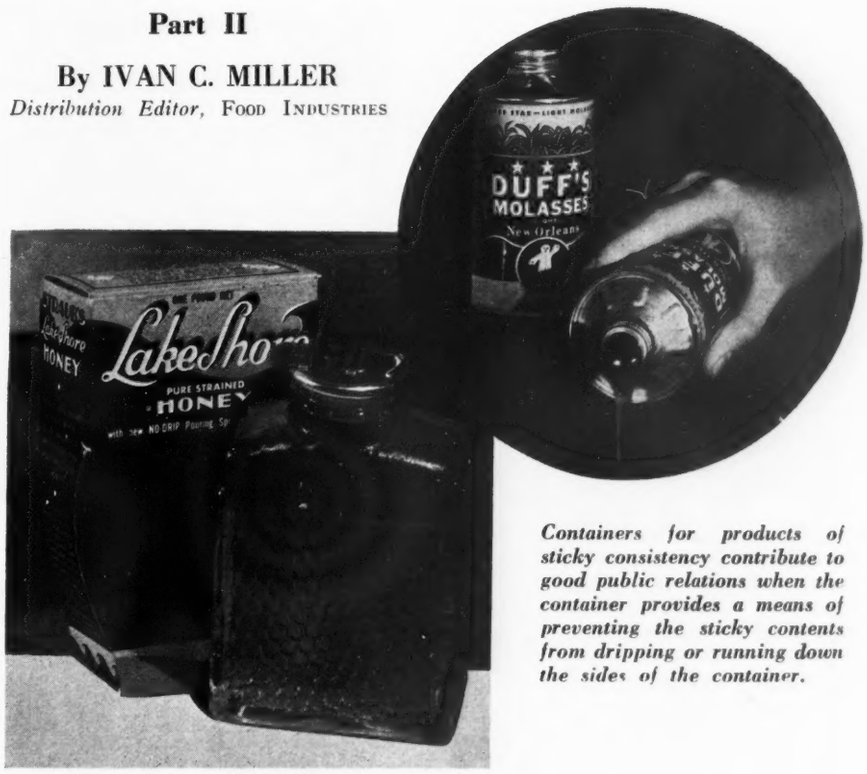
CHOOSING a product or determining standards for its quality, with the objective of obtaining consumer acceptance and good public relations, is not simple. The price that consumers will pay for any product determines the size of the market potential for any standard of quality. The quality of competing brands in each price bracket is also a determining factor.

Choice of package and package material to obtain good public relations must usually be the result of compromise. The package which might be the consumer's first choice may not be practical. Its cost may require a selling price that consumers will not pay.

In effecting a compromise between the product or package of most value to good relations, and the product or package most practical considering production equipment, labor and material costs, only the minimum sacrifice of good public relations should be considered. What profit is there in production economy when the product does not sell?

Establishing good public relations is not always a matter of increased quality with correspondingly high production costs and price to consumer. Often, improving the public relations value of a product or a package is merely a matter of common sense.

Most housewives object vigorously to waste. One certain way to incur consumer ill-will is to market a product, an unconsumed part of which remains to become a loss. Waste may occur as the result of spoilage, staling, spilling of contents, breakage or lack of adequate directions for use.



Containers for products of sticky consistency contribute to good public relations when the container provides a means of preventing the sticky contents from dripping or running down the sides of the container.

Containers in which products remain long after they are first opened gain the consumer's good will when they are broad at the base to prevent tipping and spilling. The bottle in the center has a large opening which permits the contents to flow without need of "chugging." The closure is such that when the inner cap is removed the outer cap can be replaced or removed with little effort.

Often waste is the result of packaging quantities which do not conform to kitchen use. Housewives' ill-will often results when products, recipes for the use of which designate cup quantities, are packaged in quantities such that when used by cup measurement there is a fraction of a cup remaining.

The extra large package often fills the need of a portion of the market and in some cases may therefore be justified. But when a product which may rapidly become stale is packaged in extra large quantities primarily to gain price advantage, the loss of good will because of waste through staling may be greater than the advantage gained by the apparent size-price bargain.

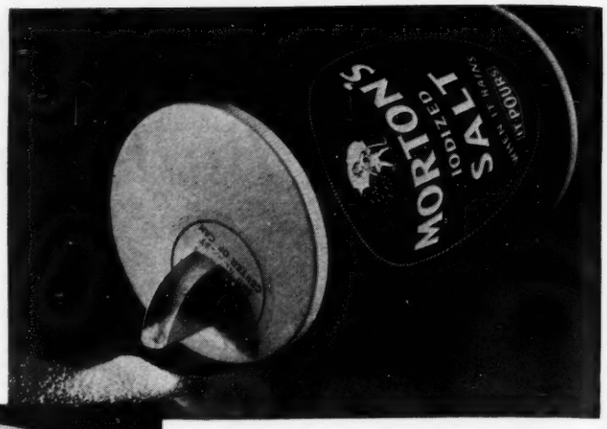
Food manufacturers have not infrequently sacrificed some of the good will built by a quality product because of an unsatisfactory package. A pack-

PUBLIC RELATIONS IN THE *Food Industries*

age awkward to handle, or one which topples over easily to spill its contents, irritates the housewife and often turns her against a good product. Particularly is this true of products not emptied immediately from the original container, but stored partially filled for future use.

Products which should normally be kept under refrigeration often are replaced by competitor's products when the container does not fit the shelves of the icebox. To be sure, the food manufacturer should not be held responsible when the refrigerator does not fit his package, but the housewife is no respector of prerogatives. She makes her purchases according to her likes and needs with no concern for the rights in the controversy between the package and the refrigerator.

Next to quality of product, the convenient package is the surest passport to the housewife's heart and also to good public relations. To the housewife, the package "opener-upper," the package she can negotiate without calling on the strong arm of a male of the family, is a joy forever. Packages difficult to open and equally difficult to close are bought by her only because of the quality of the product and in spite of the container. The lid which sticks and spills the contents when finally pried from the container, containers which tax the strength to open, and those which exhaust the ingenuity, irk the housewife and undermine good public relations.



A closure easily removed, easily replaced, builds good will for the product.

Good will is sometimes lost by an apparent attempt to impose on the housewife's credulity—by an obvious insult to her intelligence. Though "slack fill" may not be the result of intention, it is usually so credited. Manufacturers of products such as cereal flakes which "shake down" during transportation to the consumer, face this problem. Apparent "slack fill" due to "shake down" will be characteristic of competing similar products and will therefore result in less reproach from consumers than when a package or a container is slack filled through carelessness or by intent. The value of the package as a good will builder is not always apparent at the time of its first introduction to the market. The re-used container has often been an apparent good will

This new cereal food makes forceful use of the package to obtain good public relations. The photographs on the back panel of the package indicate the company's control of raw materials, the adequacy of processing, the sanitation and the cleanliness of the plant. The side panel of the package provides a description of the ingredients and a percentage analysis of contents, as well as suggestions for use. On the top of the container are instructions for opening the package.

These tins contain products which remain for long periods on the shelves of the housewife's pantry. They are designed to stack on the shelf in the minimum space and yet because of the name of the content on the side panel permit the housewife to readily identify the contents of any container without shifting them about.

builder, an ambassador of good public relations, until the housewife's appetite for the souvenir container has become satiated and with it her appetite for the product.

Experience recently, especially since the increased use of the descriptive label, has proved the public relations value of informative instructions on the label. Particularly is this true of those labels which indicate uses for the product and which provide workable recipes. The faulty recipe is a boomerang. Whatever information is provided on the label, or on an insert for the enlightenment and guidance of the housewife, should be in legible type. Instructions which are difficult to read are but little less an irritant to some housewives than the package provokingly difficult to open.

Good public relations insures consumer acceptance and repeat orders. Both the product and the package are important emissaries in creating sound public relations. In any controversy or competition, other things being equal, the last word carries with it a decided advantage. The package is always the last contact with the public. It denies or confirms other efforts to obtain good public relations, efforts often involving considerable expense. The satisfactory package is a satisfactory investment, only if it is a good public relations servant.

Sliced packaged bread has increased the staling problems of the baker. One baker has met this problem by enclosing the contents of his patented package in two separate wraps, the one to be opened after the contents of the other is used. Staling is thereby minimized.

The rip cord which makes difficult packages easily accessible is a staunch ambassador of good public relations.

Food DISTRIBUTION

There is a trend among manufacturers who package their products in folding cartons with an outer wrap, to use containers which may be opened with minimum effort. Adequate directions for opening a package are as important in building good public relations as adequate description of the uses of the product. The package which provides easy access to the contents and an easily manipulated, secure closure makes a strong bid for consumer good will.

New Packages & Products

DURING the last year many food manufacturers have made changes in the design or construction of their food packages. This coming year will probably record many more changes. What were the objectives the manufacturers hoped to accomplish with their new packages? What characteristics of package design will set the tempo for the new crop of packages which will make their bow during 1939.

To obtain data which would indicate the intent of food manufacturers who have recently introduced new packages, FOOD INDUSTRIES sent questionnaires to many of them. Results from the questionnaire and some of the new packages themselves will be discussed in this and following issues of FOOD INDUSTRIES.

The questionnaire asked manufacturers to designate the reason for their package changes, grouping these changes into three classifications under the heading "For Reasons of Economy," "To Better Preserve the Product," and "To Increase Sales Appeal."

Although approximately one-third of those manufacturers who returned questionnaires considered economy as one of the objectives accomplished with the new package, no single manufacturer had economy as the major objective in redesigning the package. Sixty-eight per cent of the food manufacturers did not record any economy resulting from the new package.

More than half of those manufacturers who did effect economies in the new package did so through reduced manufacturing costs of the package itself. Though the new package reduced transportation costs for more than a third of those who reported a packaging economy, only a few gained economy because the package was better suited for the production line and the machine operations. Some manufacturers who reported that no economy resulted to the manufacturer as the result of introducing the new package did, however, report that the new package resulted in economy to distributors and retailers because of lowered handling costs.

Less than 10 per cent of the package changes were made for the single purpose of preserving the quality of the product. However, almost half of the manufacturers returning questionnaires did improve the protective quality of the packages while improving other characteristics.

Three-fourths of those who increased the protective qualities of the package did so to keep the product fresh for a longer time. Only a third were interested in protecting the product from breakage or other damage in transit. An air-tight moisture-proof package was the objective of approximately half of the manufacturers interested in preserving the quality of the product. Of those who reported a package change to better maintain the quality of their product more than half were concerned with a package which would extend the shelf-life of the product.

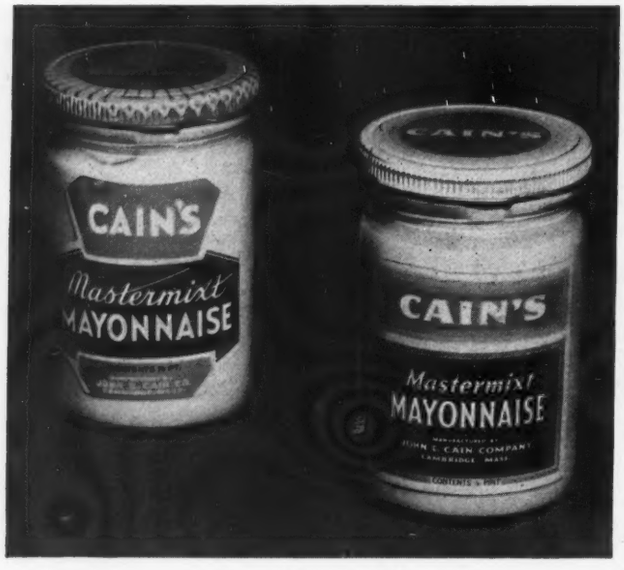
Package improvements to increase sales appeal will be discussed in the next issue of FOOD INDUSTRIES.

Greater Appeal at Lower Cost

THE NEW LABEL for "Mastermix" mayonnaise, product of John E. Cain Co., Cambridge, Mass., redesigned to conform to the Federal Food, Drug and Cosmetic Law, not only increases visibility through more appealing color combinations but also introduces an economy in labeling.

Sales Appeal and Protection

THE NEW PACKAGE for the crisp cheese flavored canapes "Waffies" product of King Cone Co., New York, N. Y., consists of a double-walled amber glassine heat-sealed bag protected by a one-piece folding carton. The product is further protected by an outside transparent cellulose wrap. The tight seal characteristics of the several wraps extends the shelf-life of



New label on right.

New package on left.

Beauty Protection and "Re-Use"

"PARADISE FRUIT CAKE," product of Ward Baking Co., New York City, although an attractive re-use container, has other values. This modernized package retains moisture in the product, thereby keeping it fresh and also protects the product from crushing or breaking in transit from manufacturer to consumer.

Improved Package Cuts Costs

THE NEW PACKAGES, both the unit and shipping container for "Carling's Black Label" beer, product of Brewing Corporation of America, Cleveland, effect economy, provide better preservation of the product and increased sales appeal. Manufacturers' costs are reduced through using a smaller light-weight unit and both a smaller and lighter shipping container. Light-weight containers and elimination of return empties cut transportation costs. The new containers minimize the effect of sunlight, reducing, therefore, the possibility of spoilage of the product. The modernized packages are easier to handle in warehouse and retail outlets, require no deposit, and are better suited for self-service distribution.

New unit and container on left.

To Appearance Add Protection

THE NEW PACKAGE for General Foods Corporation's "Baker's Chocolate" possesses several advantages over the former package. The bar, enclosed in metal foil with an overwrap of colorful paper backed foil, has a metallic lustre. The new package materials not only keep the product fresher and increase shelf-life but, because of the new color combination, give the product added sales appeal to induce greater self-service store sales. Both the product and the label follow a modern trend. The label states "Vitamins A, B and D in carriers added."

Food DISTRIBUTION

the product. At the same time, the different contrasting colors through the transparent outer wrap give the new package greater sales appeal. The new package is designed to create impulse sales in self-service stores.

Hints and Hurdles

Attacked from Many Fronts

"THE WHOLESALE BUSINESS is coming back into its own with manufacturers adopting more and more the wholesale channel of distribution instead of selling directly to the retailer." Presumably this statement made by William Robbins, vice-president of General Foods Corporation, would indicate his belief that food manufacturers will in the future find it more advantageous to distribute their products through wholesalers rather than selling to the retailers direct. This attitude of food manufacturers is further indicated by a statement made by Paul S. Willis, president of Associated Grocery Manufacturers of American recently. "Changing conditions in distribution and improvements made by wholesalers in their operations are bringing about a return of greater utilization of their services by both manufacturers and retailers."

At the convention of the United States Wholesale Grocers Association at Memphis last March, the three main objectives of the Association were pointed out by R. W. Rowe, executive vice-president of the Association. These objectives are: (1) Effort to have enacted a federal chain store tax bill; (2) Enforcement to an even more marked extent of the Robinson-Patman Act regulating practices and prices.

On the same day Louisiana Farmers Protective Union, Inc., filed suit in Federal District Court in Little Rock, Ark., for $8,328,576 against six chain grocery companies charging the companies with selling Louisiana strawberries below cost in an attempt to create a monopoly.

Good public relations include more than gaining the good will of consumer. The drive for good public relations requires gaining the good will of producers, of consumers, of government and even of competitors.

What A Pal!

IT IS BUT HUMAN to postpone the unpleasant task. Psychologists dub this human weakness, "retreat from reality." Business is human. At least it shares this human attribute.

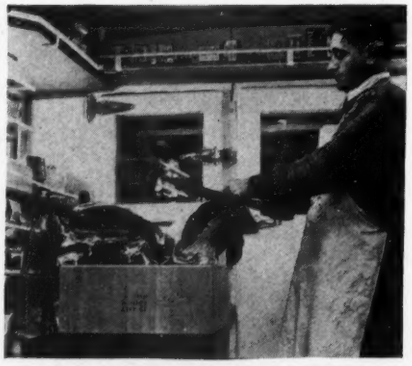
Though most of the food manufacturers were able and willing to comply with the label requirements of the Federal Food, Drug, and Cosmetic Law at the time of the law's stated enforcement date, June 25, 1939; some have, nevertheless, welcomed the possibility of postponement, even though they believed that compliance at a later date might be more difficult and enforcement much more rigid.

The way of foods is easier than the way of drugs. Not a few drug manufacturers may find it difficult to comply with the law and maintain some of their products on the market. Therefore, they may have little to lose, and may gain much through a postponement of the enforcement date. The food groups' co-sponsorship of the postponement amendment, though it may net little for foods, may save the day for drugs.

Misery loves company, but industries too are known by their company. Isn't it about time two old pals went their separate ways?

HOT BATTLE FOR THE HOT DOG

The new frankfurter "Flat Hot," now on the market in several sections of the country, promises to put up a spirited battle against the American favorite, with odds on the side of the flat hot. This new product makes a strong bid for good public relations and also good retailer relations. Because this "weiner" is flat instead of round, it fits better into either long or round bun. Being thin it need not be split for cooling or serving.



FROZEN FOODS TO FARMERS

Residents in Pennsylvania coal mining settlements, villages too small to support a grocery store, need not go to the city for groceries, fish, meat and even frozen foods. The grocery store comes to them. The itinerant store is not new, but few traveling grocery stores are refrigerated. Few carry frozen foods. This deluxe traveling grocery, Louis' Motor Store, on a new Mack truck is operated out of Hazleton, Pa.

Food DISTRIBUTION

Food Technology

NEW DISCOVERIES & INVENTIONS

METHODS OF PRESERVATION

Spices and Spoilage

UNSTERILIZED SPICES when added to processed dill pickles, spiced peaches and spiced pears carried enough bacteria to bring about a weakening in the cellular structure. This caused slippery and soft pickles, and soft and mushy fruit.

Whole and ground spices have a bacterial population of from 0 to 67,000,000 per gram (plate count). Ground cinnamon and clove were the only spices to inhibit bacterial growth in low concentrations. Ground peppercorn and allspice showed inhibiting power in 1 per cent concentration. Mustard, mace, nutmeg and ginger in 5 per cent concentrations showed inhibiting power, whereas celery seed took 10 to 20 per cent concentration to show it.

Types of bacteria vary in their behavior toward spices, but some kinds thrive in all concentrations. There is a great difference in the resistance of different bacteria to the same spice and the same organism to different spices.

Digest from "The Influence of Spices in Causing Spoilage of Dill Pickles," by Fabian, Krehl and Little, Mich. State College, Technical School for Pickle and Kraut Packers, Feb., 1939.

Better Storage Eggs by Carbon-Dioxide Oiling

GOOD EGGS in storage become bad eggs owing to: loss of water; loss of carbon dioxide, which makes the eggs more alkaline; and a thinning out of the egg white. Since eggs in the shell cannot be dried or frozen, any process which will make the shell moisture and gas-tight will make the eggs keep better.

A great improvement in keeping qualities is obtained by dipping the eggs in a paraffin oil having a 35 to 40 deg. F. pour point. Even better results are gotten by applying first a vacuum, then the oil, saturated with carbon dioxide under pressure, as this most effectively seals the pores in the shell.

Transportation affects the keeping quality of eggs adversely. Eggs which, in Omaha, averaged 98 per cent Specials and Extras before shipment, after six months storage in New York averaged less than 10 per cent in these grades for untreated eggs, over 40 per cent for plain oiled eggs, and over 66 per cent for the vacuum-carbon dioxide oiled eggs. Costs estimated from semi-plant scale operation are 6.3 cents a case for plain oiling and 15.1 cents a case for vacuum-carbon dioxide oiling.

Digest from "Storage of Shell Eggs," by T. L. Swenson, *Food Research* **3**, 599, 1938.

BAKERY PRODUCTS

Milk Protein in Baking

A MILK PREPARATION which serves excellently as an ingredient in baked products has been developed at the Institute for Crop Preservation and Agricultural Research, University of Berlin. Dried milk powder is stirred with twice its quantity of 0.5 per cent formic acid to render the protein nearly insoluble. After removing surplus liquid, the material is dried at 60 deg. C. (140 deg. F.), ground and taken up in sufficient ammonia solution to give the product a pH of 7 to 7.3. This product is dried and, since its alkalinity is too high for satisfactory baking performance, it is ground with 4 per cent of its weight of tartaric acid to bring the pH within the suitable range for baking, namely 5.7 to 6.

Digest from "Baked Products With German Milk Protein as Base," by H. Knapp, *Vorratspflege und Lebensmittelforschung* 1, 412, 1938. (Published in Germany).

Problems of Fast and Slow Dough Mixing

TO SETTLE THE QUESTION of whether high speed mixers are actually superior to slow speed mixers a Hobart C-10 machine was fitted with a special variable speed pulley attachment and operated at 16, 40, 60, 80, 120 and 160 r.p.m. for test purposes. Dough development was studied in the straight dough method with two, three and four hours fermentation time. Small loaves were made up (150 grams dough) from a strong flour (A) and a medium strength flour (B), without milk in some tests and with 6 per cent of dry milk solids in others.

It was found that each mixer speed has an optimum mixing time, longer for strong than for medium flour. Adding milk solids makes the optimum mixing time longer, just as though a stronger flour had been used. Dough properties were studied by means of farinograms, which showed that mixing along the optimum time curve gives about the same course of development in each case. The farinogram can also be used to ascertain the optimum development stage for maximum baking quality. The optimum occurs just before the plasticity as shown on the farinogram reaches its peak.

Work input (measured on a watt-hour meter) was about the same, regardless of mixing speed, along the optimum time curves. Flour A required more work than flour B, and addition of milk solids made a higher work input necessary.

Digest from "Relation of Mixing Speed to Dough Development," by Olof E. Stamberg and C. H. Bailey, *Cereal Chemistry* 15, 39, 1938.

Water Content of Doughs

OF ALL THE IMPRESSIONS which guide a skilled baker in deciding the optimum water content for dough from a given flour, stickiness is the only one which can be separated and defined. But stickiness cannot be measured so exactly as to reveal significant differences in water content. Viscosity and elasticity modulus were therefore studied in the search for properties which might serve as a guide to optimum water absorption. Viscosity depends too much on the strength of the flour to be helpful, but it was found that the elasticity modulus was the same (with only slight differences) for each dough at its optimum water content as determined by the baker.

(Turn to page 358)

The Food Industry News

GENERAL NEWS, BUSINESS TRENDS, MEN, JOBS AND COMPANIES • JUNE, 1939

F&DA Exempts Ice Cream; Rules on Other Labels

Exemption from the new food law provision that ingredients be listed on the label has been granted in the case of ice cream, frozen custard, ice milk, milk sherbert and water ice or ice sherbert, pending promulgation of definitions and standards of identity. Meanwhile, F&DA is taking action to establish standards, having called a meeting of the Food Standards Committee for June 8. This committee will also consider standards for strained vegetables and chocolate products exclusive of chocolate coated products.

Although a specific and not a collective name in declaring ingredients is required by law, the Administration has informed bakers that it will not insist on specific identification of shortening ingredients but will regard the term "shortening" as sufficient.

Administration officials have informally announced that as a temporary expedient to avoid discarding present stocks of specialty or branded bottles for beverages, not bearing all required information, the crown may bear the further required labeling. In the absence of paper labels, new supplies of special design bottles should have all of the essential labeling information blown or otherwise impressed upon the bottle body to avoid question as to ultimate compliance with the act which requires labeling information to be shown with "conspicuousness."

Reversing a former decision regarding green coffee bags, the administration has now ruled that such bags, containing green coffee which is to be processed before consumption and which is purchased on a poundage basis rather than on a stated weight per bag, need not be marked with the name and address of the manufacturer, packer or shipper nor with a statement of net weight.

Certified color used in the manufacture of candy may be declared by the use of the words "U. S. Certified Color Added" or "U. S. Certified Food Color Added." The words "artificially colored" or "artificial color" need not be used in such a case though they must be used when harmless artificial color, other than a certified food color, is used. In a candy assortment fruits and nuts (including coconut) may be listed as such without naming each. Peanuts must be listed as such.

AMERICANS AT WORK

People from New York to Honolulu were told about jobs in the meat packing industry on the CBS "Americans at Work" program on April 15. After a dramatization in the New York studios, the microphones were switched for a pickup direct from the pork cutting and ham and bacon hanging rooms of Swift & Co., Chicago. Four hourly paid employees answered questions about pork division operations, plant training courses, minimum hour guarantee, how they like their jobs, quality selection and so forth.

In regard to the 40 odd ingredients that gum contains, the Secretary of Agriculture, in denying label exemption, has suggested that all basic ingredients be lumped under one label designation, such as "Masticatory Substance" or "Gum Base." Hydrogenated oils can be lumped as "Hardened Vegetable Oils." A typical gum could be labeled: "gum base—condensed milk, hardened vegetable oil, glycerine, gum arabic, sugar, dextrose, dextrine, starch, maltose, corn syrup, flavor and citric acid."

Food Colors Certified

First certificates of purity for coal-tar colors have been issued by the Food & Drug Administration under regulations promulgated last month. These regulations, listing more than a hundred coal-tar colors and providing for their certification, were published in the *Federal Register* on May 9 and became effective immediately. The new Federal Food, Drug and Cosmetic Act provides that no coal-tar colors, except those from batches that have been certified, can legally be used in coloring foods. The requirements involve not only the coal-tar colors themselves but mixtures of colors with harmless diluents.

AGMA Praises Parade But Not Fair Trade

Nationally known brands of foods benefited from the Parade of Progress promotional efforts of April, and this project should be continued in some form. This was reported at the meeting of Associated Grocery Manufacturers of America in White Sulphur Springs, W. Va., May 8-9. Consumers were alert to and interested in the details of progress in the industry and dealers cooperated enthusiastically, it was said.

But another experiment in merchandising did not receive such high commendation at the meeting. The eleven-month trial in Ohio of maintaining the resale price of grocery products through contracts with dealers was considered no particular success. This fair trade practice was believed to have been neither helpful nor hurtful. Too often, it was felt, the minimum resale price became the selling price. It was reported at the meeting that there was now little pressure from other states for this merchandising practice, a distinct change from a year ago. A trend toward semi-self-service stores was noted as an outstanding development in the retail field.

Surplus Foods Named in Relief Stamp Plan

Selection of Dayton, Ohio, as the second city to try the stamp plan for moving surplus foods through retail channels was announced last month by Secretary Wallace. And the Secretary also named nine foods as surplus—butter, eggs, dry edible beans, dried prunes, oranges, fresh grapefruit, wheat flour, whole wheat (graham) flour, and corn meal. Other fresh fruits and vegetables may be added later. The list is subject to change dependent upon market conditions.

The food stamp plan was inaugurated in Rochester, N. Y., on May 16, where by five o'clock of that day 2,253 books of stamps had been sold with cash receipts totaling $12,368.

Food Law Delay Stymied

Action on the Lea bill delaying the effective date of the labeling provisions of the Federal Food, Drug and Cosmetic Act was still being held up by deadlock in the conference committee at the time FOOD INDUSTRIES went to press. Neither side showed any willingness to yield, though the general feeling in Washington was that ultimately the Senate conferees would give way, before the June 25 deadline.

Cereal, Brewing Chemists Hold Technical Session

Developments in technology and their application to production operations were covered at the conventions of American Association of Cereal Chemists and American Society of Brewing Chemists, held in Kansas City, Mo., May 22–26 and May 22–25. Discussing the value of research in general, E. R. Weidlein, Mellon Institute, told the cereal chemists that from the public relations viewpoint, the value of research conducted by industry should be stressed more. Without the manufacturer and distribution through industry, these results would be worthless to the public, he pointed out. Industry in America maintains 1,700 research laboratories, employing 24,000 people, and only one per cent of the gross revenue is spent on research, he said. A practical point made by Mr. Weidlein was that the new synthetic textiles make good filter materials, as they do not support bacterial growth.

At the beginning of the convention, the cereal and brewing chemists held a joint technical session. A new and promising tool for bacteriological research was developed and presented at the session by Fleischmann Laboratories. By applying recent developments in time-lapse technic and the use of microcinema photography, it is possible to obtain a continuous record of the growth and behavior of microorganisms under different conditions of environment. This technic of picturing biological reactions in moving pictures is expected to disclose the mechanism of many heretofore little understood phenomena.

Of great practical value was a paper by K. Becker, Siebel Institute, on "Heat Inactivation by Enzymes during Mashing." Amylolytic enzymes are inactivated at a temperature of 65 to 68 deg. C., alpha amylase surviving up to 84 deg. C. Proteolytic enzymes are affected at 40 deg. and completely destroyed at 70 deg. C. Pectin exerts a protective influence which increases the temperature limit. As soon as inactivation sets in, the reaction velocity of the enzyme remnants is greatly increased.

Louis Ehrenfeld reported that the brewing industry in 1938 used 500,000,000 lb. of corn and 100,000,000 lb. of rice in the form of processed adjuncts, not including sugar and other cereal derivatives. Cereal adjuncts are a desirable diluent for our high protein barleys, enabling the American brewer readily to meet the taste preference of the public. Flavor differences due to the type of adjunct are slight, but may become pronounced through the more rapid deterioration of rice.

Has American brewing research assumed the leadership which it should? That was a challenging question put to the chemists by George Sippel, Burger Brewing Co., Cincinnati. He referred to certain problems pertaining to raw materials, processing, fermentation, packaging and the utilization of by-products. He enumerated the problems as follows: adjunct studies from the standpoint of variety and suitability, regional influence on oxidizing substances in hops, a continuous brewing process, elimination of pasteurization, adoption of a standard glass container, use of a new type of glass in bottles, improvement of light-weight shipping containers and utilization of spent mash, yeast and gas. Research should be encouraged by installing pilot plants in breweries, he said.

G. F. Garnatz was elected the new president of American Association of Cereal Chemists, C. F. Davis was named vice-president and other officers were re-elected. All officers of American Society of Brewing Chemists were reelected.

CONVENTIONS

JUNE

5– 7—Flavoring Extract Manufacturers Association of the U. S. Hotel Pennsylvania, New York, N. Y.

5– 9—Association of Operative Millers, President Hotel, Kansas City, Mo.

18–22—National Association of Retail Grocers, Kansas City, Kan.

23–27—New England Bakers Association, summer meeting, The Balsams, Dixville Notch, N. H.

26–27—National Marcaroni Manufacturers Association, Park Central Hotel, New York, N. Y.

26–27—American Fisheries Society, Sir Francis Drake Hotel, San Francisco.

27–29—American Dairy Science Association, Pullman, Wash., and Moscow, Idaho.

28—National Pickle Packers Association, Chicago.

28–July 1—Second Food Technology Conference, Massachusetts Institute of Technology, Cambridge, Mass.

JULY

10–20—Sixth International Technical and Chemical Congress of Agricultural Industries, Budapest, Hungary.

27–29—Southern Wholesale Confectioners Association, Inc., Read House, Chattanooga, Tenn.

28–Aug. 7—Seventh World's Poultry Conference and Exposition, Cleveland, Ohio.

Confectioners Get Tips On Food Law Compliance

Advice on how to avoid trouble under the new Federal Food, Drug and Cosmetic Law was attentively received at the annual convention of the National Confectioners Association, in Chicago, May 22–25. Ole Salthe, consultant to the Food and Drug Administration, told the confectioners that good faith was essential to easy compliance with the conditions of the law. A common sense approach to the problems of compliance and an honest attempt to meet the requirements of the law were cited as the best procedure to avoid the complications of strict interpretation of the legal aspects of the law. Equally as important in compliance with the law as proper labeling of the package are maintenance of sanitary conditions in factories, avoidance of adulteration through the inclusion of non-nutritive substances, such as metal prizes, and elimination of slack filled containers.

Discussions were held in the production forum on the control of bloom on chocolate, the profit motive for modernization, refrigeration and air conditioning, the value of color in respect to candy and how packaging may be made a continuous operation.

Rounding out the program of the meeting were sessions on merchandising, industrial relations and governmental problems.

Exceeding past expositions by 1,000 sq.ft. in the floor space occupied, the equipment show at the convention included 70 exhibits and drew a good attendance. Buying interest centered on processing machinery having a bearing on quality control and on wrapping and packaging supplies and machinery.

H. R. Chapman, New England Confectionery Co., Cambridge, Mass., was reelected president of the association. The other officers include A. M. Kelley, executive vice-president (reelected); Harry L. Brown, Brown & Haley, Tacoma, Wash., first vice-president; S. W. Hallstrom, Walter H. Johnson Candy Co., Chicago, second vice-president; F. J. Kimbell, Kimbell Candy Co., Chicago, treasurer (reelected); M. F. Burger, Chicago, secretary, (reelected).

Standards Committee To Try Open Meeting

Experimenting with a new technic in conducting preliminary meetings on food standards, the Food Standards Committee will hold an open meeting on ice cream, June 9. Any member of the industry, or any interested consumer, may attend and make a statement without previous appointment. Heretofore, these sessions have been behind closed doors, members of the industry attending only on invitation or appointment. If the new technic succeeds, and if these open meetings do not result in long debate, this new idea may become standard procedure.

Malt Institute Formed

As a move to cope with technologic problems arising in the malt using industries, a research organization has been formed. Known as Malt Research Institute, the organization has headquarters at Madison, Wis., and its secretary is Leonard M. Josephson, Box 2039, Madison.

Activities of the Institute will be directed by an executive committee composed of representatives from the malt using and malt producing industries. These include:

Chris Kurth, Jr., Kurth Malting Co., Milwaukee; Herbert Ladish, Ladish Stoppenback Co., Milwaukee; Paul Esselborn, Cliffside Brewing Co., Cincinnati; G. L. Becker, Becker Products Co., Ogden, Utah; Marcus Maegerlein, Pointer Brewing Co., Clinton, Iowa; R. I. Claassen, Hiram Walker & Co., Inc., Peoria, Ill.; Robert Haman, Wander Co., Villa Park, Ill.; Louis Ehrenfeld, Pabst Brewing Co., Milwaukee; J. G. Dickson, University of Wisconsin; and G. A. Wiebe, Department of Agriculture. Mr. Dickson is chairman.

The initial project of the Institute will be to determine the relative value to the malt using industries of two varieties of barley: Wisconsin Barbless and Oderbrucker.

Government and Industry Argue at Food Hearings

Many points of processing procedure and product formulas have been bones of contention in the drawn out hearings on standards which the Food and Drug Administration has been holding in Washington. The most frequently arising subject of controversy has been the requirement for specifying dextrose on the label when used as an ingredient in combination with sucrose. At the hearing on canned peas, E. H. Wiegand, Oregon State College Experimental Station, testified that he had obtained satisfactory results from a combination of about equal parts of sucrose and dextrose, asserting that the latter brought out the natural flavor of the peas. Ralph S. Goodale, Marshalltown (Iowa) Canning Co., said at the hearing that a combination of dextrose and sucrose had proven most satisfactory, his firm using 25 per cent dextrose and 75 per cent sucrose. The alcohol insoluble-solids test for peas was assailed by Frank Shook, Tri-State Packers Association, who declared that the results of the test are too variable.

Argument waxed freely at the hearing on canned vegetables over the proportions of each vegetable that should be included in mixed vegetable packs. The government defended the requirements in its proposed definitions and standards, published in the *Federal Register* on March 24, but representatives of the industry wanted more freedom in this respect. R. H. Winters, Larsen Co., Green Bay, Wis., insisted that the government proposal would make it impossible to pack okra and tomatoes, as well as "triple succotash." No less emphatic was Victor B. Bonney, chief chemist for the canned foods section of F&DA, in his opposition to changes in the proposed formulas for put-in-weights of vegetables in a mixture. He said that formulas suggested by the industry would allow a can to be filled up to 50 per cent with a cheaper vegetable and require only 5 per cent of the more costly vegetable. Another point of argument in this hearing was whether dried vegetables could be used in the can without being designated on the label. The government held to the opinion that this was not possible.

Setting a record for distance in the food hearing marathon, the hearings on milk and cream products extended from May 1 to 12. A bitter fight developed over the use of the word "skim" in the designation of dried milk. Industry witnesses testified that the use of "skim" would seriously affect the sale of the product in which the milk was used as well as its sale in the straight form. But the government argued that not only had the product always been known as skim milk but that the name accurately described the product. The old argument over sucrose vs. dextrose popped up again in this hearing. E. R. Gehl, Badger Milk Products Co., Germantown, Pa., said his company used an 80-20 sucrose-dextrose mixture, while Lewis W. Sanbirne, Crowley Milk Co., Binghamton, N. Y., testified that his firm used 50-50 sucrose and dextrose to get a smoother product.

Following preliminary hearings, recommended standards for egg products were announced in the *Federal Register* on May 10.

Hold Pop-up Week

For the purpose of creating more consumer demand than the estimated 80 bottles per person per year, National

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Second M.I.T. Food Technology Conference
Cambridge, Mass.—June 28-July 1

WEDNESDAY, JUNE 28

9:30 A.M.—Symposium on Quality Control in Food Manufacturing

Prof. S. C. Prescott, Dean of Science, M. I. T., "The Training of Food Technologists"; W. L. Campbell, General Manager of Manufacturing, Kroger Grocery and Baking Co., "Quality Control in Food Manufacturing"; Dr. E. J. Cameron, Acting Director, National Canners Association Research Laboratory, "Quality Control in the Canning Industry"; Dr. H. F. Taylor, President, Atlantic Coast Fisheries, "Quality Control in the Fisheries Industries"; Dr. L. K. Riggs, Director of Research, Kraft-Phenix Cheese Corp., "Quality Control in the Dairy Industries"; Dr. R. C. Newton, Chief Chemist, Swift & Co., "Quality Control in the Packing Industry."

12:30 P.M.—Luncheon at Walker Memorial Dining Hall

Special speakers:—Dr. Karl T. Compton, President, M. I. T.; Clarence Francis, President, General Foods Corp.

2:00 P.M.—Symposium on Food Packaging and Containers

R. H. Lueck, Manager, Research Dept., American Can Co., "Current Advancements in Canning Technology"; Wm. B. Esselen, Jr., and H. A. Barnby, Director, Packaging Research Division, Owens-Illinois Glass Co., "A Resume of Light on Packaged Foods"; Dr. W. H. Harrison, Director, Research Dept., Continental Can Co.; Dr. S. H. Ayres, Director, Research Dept., Crown Can Co., "The Role of the Laboratory in the Problems of the Canners"; O. F. Benz, Director, Cellophane Division, E. I. duPont de Nemours & Co., "Transparent Food Containers and Wrappers and Their Utilization"; M. T. Rogers, Engineer, Cryovac Division, Dewey & Almy Chemical Co., "The Latex Container and Its Application for Frozen Meats and Poultry."

THURSDAY, JUNE 29

9:30 A.M.—Bakery Technology Symposium

Prof. C. H. Bailey, University of Minnesota, "The Physical Properties of Dough in Their Relation to Baking Technology"; Dr. C. N. Frey, A. S. Schultz and L. Atkin, Fleischmann Laboratories, "Recent Developments in the Vitamin Technology of Bread"; Dr. J. A. Tobey, Director, Dept. of Nutrition, American Institute of Baking, "How Baking Technology Affects National Nutrition"; Dr. F. W. Miller, Jr., E. I. duPont de Nemours & Co., "Mold Control in Bakery Products."

1:30 P.M.—Second Quality Control Symposium

J. L. Murphy, vice-president, Canada Dry Ginger Ale Co., "Quality Control in the Carbonated Beverage Industries"; August Haffenreffer, Chairman, Technical Committee, Master Brewers of America, "Quality Control in the Brewing Industries"; H. H. Hall, Bureau of Chemistry & Soils, "Quality Control in the Sugar Industries"; Dr. S. A. Beatty, Halifax, Experimental Station, "Biochemical Changes in Stored Fish"; Prof. B. E. Proctor, M. I. T., "Quality Control Methods for Food Technologists"; Prof. R. S. Harris, M. I. T., "The Effect of Food Processes on Vitamin Content."

FRIDAY, JUNE 30

9:00 A.M.—Food Engineering Symposium

Dr. J. A. Dunn, Chairman, Director of the Research Bakery, Lever Brothers Co., "Bakery Taste and Its Control"; Prof. W. H. McAdams, M. I. T., "Fundamental Principles of Heat Transfer"; Loomis Burrell, Cherry-Burrell Co., "Engineering Aspects of Heat Transfer in the Dairy Industry"; Dr. P. D. V. Manning, Vice-president, Western Condensing Co., "The Design and Operation of Food Concentrating Equipment"; Dr. W. H. Cook, National Research Council, Ottawa, "Humidification of Freezers"; Prof. J. W. Horton, M. I. T., "Instruments for Control Operations in Food Industries."

1:00 P.M.—Symposium on Food Refrigeration

George E. Hulse, Vice-president, Chief Engineer, Safety Car Heating & Lighting Co., "Recent Advances in the Refrigerated Storage and Transport of Foods"; Dr. Mary E. Pennington, "Quality Control in the Refrigeration Industries"; Dr. D. B. Jones, Bureau of Chemistry and Soils, "Effect of Refrigeration on the Solubility and Digestibility of Plant Proteins"; Prof. F. J. Beard, Iowa State College, "Locker Plants for Frozen Foods; Their Engineering and Economic Aspects."

SATURDAY, JULY 1

9:00 A.M.

L. V. Burton, Editor, FOOD INDUSTRIES, "The New Food Law and Its Relation to Food Technologists of the Future"; Dr. O. E. Baker, Bureau of Agricultural Economics, "Trends in Food Production and Consumption in the United States"; Major P. P. Logan, Quartermaster Corps, U. S. Army, "Subsistence of the Army in War."

Plans have been made to hold an organization meeting immediately after the conclusion of the Food Technology Conference for the purpose of forming a professional society of Food Technologists.

Advance registration by mail is desirable. Write to Prof. B. E. Proctor at M.I.T.

Bottled Carbonated Beverage Week was held May 22 to 29. This is the second year in which 6,500 bottlers of carbonated soft drinks have cooperated with retail dealers in promoting beverages. Public relations were furthered by invitations to the public for visits to carbonated beverage manufacturing establishments.

Acetylene Ripens Fruit

Acetylene is effective in ripening peaches, oranges and other fruits prior to the normal ripening date. This development in technology is reported from South Africa via the Chemical Division, Bureau of Foreign and Domestic Commerce. The fruit is placed in an atmosphere containing acetylene, in a process developed by D. J. Dreyer, senior fruit inspector of the Union of South Africa government, and ripens more speedily than under normal conditions. The process makes use of an atmosphere containing one per cent of acetylene at 21 deg. C. The Chemical Division reports that "most gratifying results" have been obtained with tomatoes, citrus fruits, plums and other fruits.

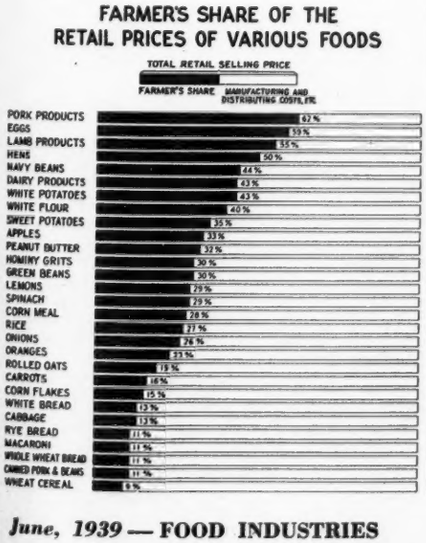
Biscuit, Cracker Bakers Hear Merchandising Hints

Merchandising problems dominated the joint convention of Independent Biscuit Manufacturers Co., Inc., and Biscuit and Cracker Manufacturers Association of America, which was held in Chicago, May 16-18.

Point of sale is the best place to determine public buying habits, was the observation of O. F. Benz, du Pont Cellophane Co., Inc. Reported results of buying-habit surveys indicate that shopping lists are growing shorter and impulse buying is on the increase. A department-store study showed that 70 per cent of the shoppers bought from a shopping list, with 63 per cent of those buying more than intended because of impulse. A grocery-store study revealed that 75 per cent used a shopping list with 20 per cent of them buying additional items on display. Brand names influence 62 per cent of the buying of unsweetened crackers, whereas only 30 per cent of the buyers of sweetened crackers or biscuits are influenced by brand names. The self-service store appears to be the important point for increased impulse buying because of the opportunity it offers to the shopper to see, handle and examine the packages displayed for sale. The lower 50 per cent of the buying public is particularly price conscious, to the exclusion of quality considerations; the top 10 per cent buy what they want regardless of price; but the intervening 40 per cent of the buying public is the profitable market, as well as the most discriminating and circumspect in its seeking for the best value in quality for the money expended. That market is the one regarded by Mr. Benz as the one towards which sales efforts should be directed.

Factual information on their products in the grocery in the form of movie presentations, booklets, recipes and menu suggestions is the best help that food manufacturers can give grocers and grocery clerks to aid in the sales of their products is the conviction of Gerrit Vander Hooning, president of National Association of Retail Grocers.

"The true point of sale is not at the point of purchase but at the point of use," is the declaration of Mrs. W. E. Fribley, president of Housewives' League of America. "Housewives are learning that the integrity of the manufacturer is their greatest safeguard. Confidence is the magnet which draws the housewife back to the same product, but it is easily shaken by trick names, obscure weight or misleading labels," Mrs. Fribley said.



Better Public Relations Seen as Need By Millers

Need for improved public and trade relations was emphasized during the 37th annual convention of the Millers' National Federation held in Chicago, May 9 and 10, with 315 members of the industry registered.

Open session reports covered the industry accomplishments of the past year in respect to the establishment of four new clearing houses to provide accurate market service, to supply information on quantity of flour being sold, to establish reliableness of reports and rumors and to distribute reliable cost data. Particular attention was called to the value of the working out and adoption of a standard form of

CAPITAL VIEWS

"COMMON OR USUAL"—Names of ingredients on food labels should be the "common or usual name." There is nothing subtle about this. It means just what it says. So the Food & Drug Administration is ruling that simple words that would ordinarily be understood are what they want on the labels. Specifically they have ruled that caramel coloring in beverages can properly be called "burnt sugar coloring" or "added caramel color" or "colored with caramel," if such be the fact. The process of treating vegetable oils with hydrogen, which gives a lard substitute, produces "hydrogenated oil" or "hardened vegetable oil." It looks as though mere common sense should guide food makers in their ingredient naming.

SUGAR COMPETITION—While the battle is raging between cane sugar and corn sugar for strategic advantages in labeling foods, data is presented by the Department of Commerce from the last census of manufactures. This shows that over 50 per cent of all corn sugar produced goes into manufactured foods, principally bakery products, confectionery, sirups, beverages and canned goods. About 30 per cent of the total supply of beet and cane sugar is used similarly in manufacturing foods; about two-thirds goes through the grocery for home and institution use as such. The total reported consumption of corn sugar in food manufacturing exceeds a quarter of a billion pounds per year, and this use is growing.

"INTERSTATE" EVERYWHERE—Two more Supreme Court decisions further limit activity that may be called "intrastate". Under one it is ruled that workers manufacturing goods that are sold at the point of manufacture are still subject to federal labor regulation if the goods later go into interstate commerce. In another it is stated that Congress is competent to regulate goods movement in such commerce (tobacco, for example) even though Congress could not prohibit the growing of the tobacco originally. There appears no important industrial activity that Congress may not now supervise.

FOOD BUDGETS—The Labor Department inquiries show that the food industry is the first one to gain from increased family income. If a typical family in a middle-size city is boosted from $400 to $800 per year in income, it spends about $104 more per year for food. Food manufacturers seem to have the biggest stake of all in the effort to get more money in the pocketbook of the low-income families.

ONLY LABEL DELAYS — Unexpectedly vigorous legislative effort to secure postponement of the effective date of the food and drug law is producing results with respect to labels only. No food manufacturer should assume anything but that the law is fully in force from June 25 except on certain label details specifically covered by the postponement proposals.

contract now covering 95 per cent of bakery flour sales and the need for a similar sales contract form for family flour. Satisfaction was expressed in the results of the work of the Wheat Flour Institute. During the five years of its existence the volume of flour sales has shown a continued increase of approximately 1,000,000 bbl. per year.

Suggested achievements for the coming crop year are: (1) Improved condition in family flour trade and better prices for all flours. (2) Further clearing up of rumor menace. (3) Putting an end to reuse of bags. (4) Development of better sales departments. (5) Straightening out of brokerage relations. (6) Improved accounting methods and better use of existing ones. (7) Extension of help to small mills. (8) Square facing of credit problems. (9) Development of workable family flour sales contract form. (10) Better personal acquaintance among industry members. (11) Development of sound industry practice.

In his address before the luncheon meeting James F. Bell, Chairman, General Mills, Inc., cautioned that repeating blunders of the past is no way to prepare for greater prosperity in the future. He said that an increase in sales has too often meant an increase in operating losses, that the possibilities of new and better products have not been exhausted and that competition from other foods is of more consequence than intra-industry competition. Mr. Bell also told the millers that although research has resulted in no such outstanding and revolutionary discoveries as led to the adoption of the roller mills and the middling purifiers more than 70 years ago, there is plenty of room for improvement in both products and methods of processing as well as opportunities for better merchandising.

Research on Gas Storage

Convinced of its merit and need, the American Institute of Refrigeration on May 1st announced sponsorship of a broad cooperative research program to study quantitatively the use of CO_2 as a preservative of perishables during refrigerated storage and handling. The program is under the guidance of an A.I.R. General Committee consisting of Dr. E. H. Harvey, director of research, Wilson & Co., Chicago, as chairman; Dr. M. E. Pennington, consulting refrigeration engineer, New York; Dr. S. C. Prescott, dean of science M.I.T., Cambridge, Mass.; Gardner Poole, vice-president, Birds Eye Packing Co., Boston; and G. A. Horne, president, Merchants' Refrigerating Co., New York.

This general committee will be in full charge of the research program, will assign the work to be done and will allot the funds to be spent on each major food product studied. Advisory committees from the A.I.R. will meet regularly to make recommendations to the general committee for studies to be made on each major food product.

	Total		Beet sugar	Cane sugar	Corn sugar
	Pounds	Cost	Pounds	Pounds	Pounds
Total reported	3,923,982,252	$186,650,172	767,852,504	2,904,278,939	251,850,809
Beverages:					
Alcoholic (Distilled Liquors; Malt Liquors; Rectified and Blended Liquors; Vinous Liquors)	107,580,889	$ 4,385,010	1,836,430	23,644,004	82,100,455
Non-alcoholic	291,924,527	14,321,279	10,780,948	278,856,575	2,287,004
Bread and Other Bakery Products	1,130,639,487	55,031,680	278,819,580	749,449,194	102,370,713
Canned and Dried Fruits and Vegetables	612,667,098	28,674,735	162,186,900	440,396,658	10,083,540
Chewing Gum	59,520,509	2,772,009	19,709,737	38,220,685	1,590,087
Chocolate and Cocoa Products	243,321,893	11,210,383	48,009,804	194,451,644	860,445
Confectionery	761,049,404	35,924,626	182,126,414	559,191,264	19,731,726
Dairy Products (Butter; Cheese; Condensed and Evaporated Milk)	138,514,917	6,776,256	38,939,628	96,512,349	3,062,940
Flavoring Extracts and Flavoring Sirups	335,649,928	16,484,208	11,946,719	308,543,922	15,159,287
Food Products Not Elsewhere Classified	196,887,896	9,170,474	11,089,421	175,452,403	10,346,072
Tobacco Industries (Cigarettes; Cigars; Tobacco, Chewing and Smoking, and Snuff	39,943,671	1,632,038	2,041,400	36,683,390	1,218,881
Other Industries (Flour and Other Grain-Mill Products; Macaroni, Spaghetti, Vermicelli, and Noodles; Vinegar and Cider)	6,282,033	267,474	365,523	2,876,851	3,039,659

Sugar Use by Industry

According to the U. S. Department of Commerce, reporting data compiled by the Bureau of the Census, American industry used almost four billion pounds of cane, beet, and corn sugar in 1937. A breakdown is given above:

No Rain, No Wheat

Dry, hot weather in the wheat growing regions of the United States and Canada combined with low subsoil moisture to cut the prospects for a good 1939 North American wheat crop. The May 1 estimate of the Crop Reporting Board for winter wheat was 543,928,000 bu., some 5,000,000 bu. below the April 1 estimate, but still 6,000,000 bu. above the average of private estimates. Spring wheat planting is up to expectations, but lack of moisture in the Northern States and Canada makes a less than average crop likely. On the whole, it is likely that the wheat crop will be below the average of the past ten years.

More Sugar Consumed

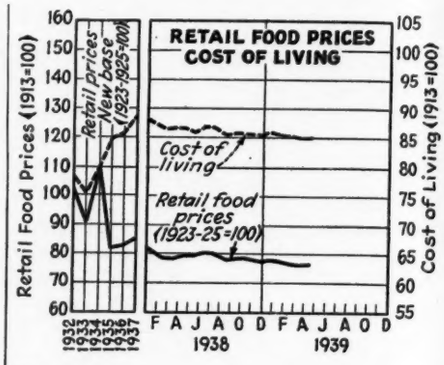
As reported by AAA, sugar deliveries by refiners, beet processors and importers for the first four months of 1939 were higher than in 1938. The figures reported were 1,941,681 tons for the period this year compared to 1,760,440 tons for the same months in 1938, an increase of 10.3 per cent.

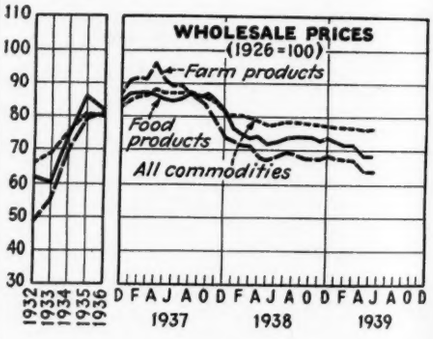
Consumption of Lard Expected to Increase

In a recent report of the Bureau of Agricultural Economics, a prospective increase in lard consumption in 1939 is forecast. In the past fifteen years, the per capita consumption of lard and edible vegetable oils has been relatively constant and has averaged about 22 lb. But, from year to year, the relative amounts of lard and vegetable oil making this total, have varied greatly.

In the past few years, lard production has been low. Consequently, its place in consumption has been taken largely by vegetable oils, of which a considerable part has been imported.

If the combined per capita consumption of lard and edible vegetable oils continues at the same level this year as in recent years, the increased production of lard should cause its higher consumption at the expense of the vegetable oils. However, the relative oils





Construction News

	Pending (thousands)	Awarded May (thousands)	Total Awarded 1939 (thousands)
Bakery	$184	$40	$594
Beverages	643	716	2,387
Canning and Preserving	40	.....	160
Confectionery	.....	.....	.....
Grain Mill Products	1,325	1,040	1,250
Ice Manufactured	.....	.....	295
Meats and Meat Products	150	30	412
Milk Products	200	155	691
Miscellaneous	2,495	210	1,009
	$5,037	$2,191	$6,798

and fats consumption figures will be influenced considerably by the size of the 1939 crop of cottonseed.

Food Commodity Prices Show Some Improvement

Some firming has characterized certain commodity price levels in recent weeks, in spite of a slight recession in general commodity price indexes. The *N. Y. Journal of Commerce* weekly price index (all commodities) stood at 74.9 on April 15 and at 74.7 on May 13. In contrast, this same index for grain prices rose from 57.6 to 61.8 in the same four weeks and also increased for textiles, fuels, and building materials. Other elements in the composite index were stationary or declined in the period. Fisher's index number moved slightly in the opposite direction, having stood at 79.9 on May 13 and a 79.8 four weeks before.

Individual food material price movements during the three months ending May 15 are notable for the improvement in grain prices. Wheat, No. 2 hard winter, which stood at 66½ cents on Feb. 15 had reached 73½ cents by May 15. Corn, No. 3 yellow, was 47¾ cents on the earlier date and increased to 51 cents at mid-May. Rye rose in the same period from 64¼ cents to 67⅛ cents, and oats rose from 31 cents to 33¾ cents.

In contrast, meats declined during the three months from Feb. 15 to May 15, as did eggs and dairy products. Coffee and cocoa were unchanged, while raw sugar prices rose 15 cents per hundred pounds.

Data for the Charts

In preparing the curves shown on this and the preceding pages of FOOD INDUSTRIES, data were obtained from the following sources: Prices received by farmers, U. S. Department of Agriculture; employment, payrolls, wholesale and retail prices, U. S. Department of Labor; cost of living, National Industrial Conference Board; commodity price index, *N. Y. Journal of Commerce;* business activity index, *Business Week;* farmer's share of the retail prices of foods, compiled by National Dairy Products Corp. from data of U. S. Department of Agriculture.

INDICATORS

FLOUR PRODUCTION in April, 1939, as reported by *The Northwestern Miller* for mills representing about 60 per cent of U. S. production, was 5,442,548 bbl. This compares to an output of 5,113,253 bbl. by the same mills in the corresponding months of 1938.

SALES of confectionery and competitive chocolate products in March, 1939, were $19,025,000 which represented an increase of 2.7 per cent over sales in March, 1938, and 3.8 per cent over sales of February, 1939.

TOMATO ACREAGE expected to be planted to tomatoes for manufacture in 1939 is reported by the BAE at 353,290 acres, compared to 408,360 acres in 1938.

CUCUMBER ACREAGE for pickles in 1939 is reported by the BAE at 64,710 acres, compared to 89,090 acres in 1938.

PRUNE PRODUCTION this year on the West Coast is now expected to be 20 per cent below the 1938 output.

ORANGE PRODUCTION in Florida this year is estimated at a total of 27,700,000 boxes, exclusive of tangerines.

COFFEE DELIVERIES to the United States, from July 1, 1938, to May 1, 1939, amounted to 11,477,762 bags, an increase of 10.7 per cent over deliveries for the corresponding period a year before.

PAPAIN (papaya juice, used as a meat tenderizer) imported into U. S. in 1938 totaled 223,000 lb., an increase of 23 per cent over 1937 imports.

FRUITS, frozen, in storage on May 1, 1939, totaled 75,940,000 lb., compared to 95,098,000 lb. on the same date of 1938 and 54,270,000 lb. for the 1934-1938 average.

VEGETABLES, frozen, in storage on May 1, 1939, totaled 47,383,000 lb., compared to 21,832,000 lb. a year before.

BUTTER in storage on May 1, 1939, was 70,861,000 lb. This compared to 20,144,000 lb. on May 1, 1938, and a 1934-1938 average of 9,812,000 lb. for the date.

CHEESE, all kinds, in stock May 1, 1939, amounted to 75,348,000 lb., compared to 76,289,000 lb. a year before and a 1934-1938 average for May 1 of 69,414,000 lb.

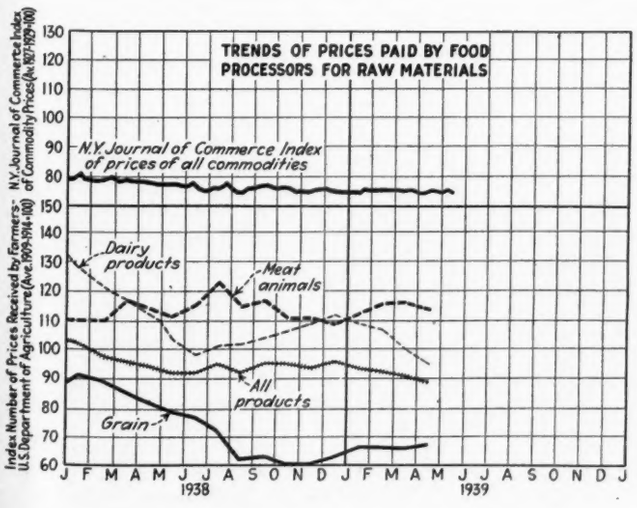
EGGS, case equivalent, in storage on May 1 of this year totaled 5,884,000 cases. The quantity on May 1, 1938, was 6,515,000 cases, and the 1934-1938 average for May 1 was 6,069,000 cases.

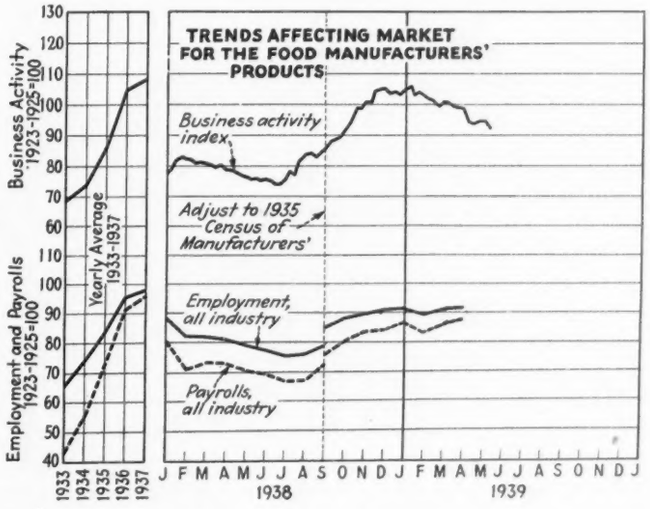
POULTRY, all kinds, in frozen storage on May 1 of this year amounted to 70,580,000 lb., compared to 60,053,000 lb. on May 1 last year, and a 1934-1938 average of 63,058,000 lb. for the date.

MEAT, all kinds, in cure and storage on May 1, 1939, was 627,360,000 lb. The figure for May 1, 1938, was 606,725,000 lb., and the 1934-1938 average for the date was 726,238,000 lb.

LARD in storage, May 1, 1939, totaled 129,214,000 lb., compared to 121,890,000 lb. on May 1, 1938, and an average for the same date, 1934-1938, of 139,054,000 lb.

WEEKLY FOOD PRICE INDEX of Dun & Bradstreet stood at $2.28 on May 9, 1939, which was 2.6 per cent below the figure for the same date in 1938.


TRENDS OF PRICES PAID BY FOOD PROCESSORS FOR RAW MATERIALS
N.Y. Journal of Commerce Index of prices of all commodities
Dairy products
Meat animals
All products
Grain
Index Number of Prices Received by Farmers: U.S. Department of Agriculture (Ave. 1909-1914=100)
N.Y. Journal of Commerce Index of Commodity Prices (Ave. 1927-1929=100)
J F M A M J J A S O N D J F M A M J J A S O N D J
1938
1939


Business Activity 1923-1925=100
Yearly Average 1933-1937
Employment and Payrolls 1923-1925=100
1933 1934 1935 1936 1937
TRENDS AFFECTING MARKET FOR THE FOOD MANUFACTURERS' PRODUCTS
Business activity index
Adjust to 1935 Census of Manufacturers'
Employment, all industry
Payrolls, all industry
J F M A M J J A S O N D J F M A M J J A S O N D J
1938
1939

Men, Jobs & Companies

INDUSTRY

Canada Dry Bottling Co. has completed construction of a $100,000 plant in St. Louis to serve ten Missouri and thirteen Illinois counties.

Canada Dry Ginger Ale, Inc., is establishing a $100,000 bottling plant at Norfolk, Va., where it has had a distributing plant.

Centennial Flouring Mills Co., Spokane, Wash., is constructing a $750,000 flour mill, the first new flour mill built in the Northwest in fifteen years. With a daily capacity of 1,400 bbl., the new plant will have roller mill equipment that effects an 18 per cent saving in space and a reduction in operating cost, and it will have scientific air conditioning of all operations, according to Allis-Chalmers Mfg. Co.

Coca-Cola Bottling Co. will start construction soon of a new bottling plant at Worcester, Mass., to cost $180,000. Measuring 234x112 ft., the plant will be two stories high.

Fredonia (Wis.) Canning Co. suffered a $100,000 loss of stock, equipment and buildings when fire recently destroyed its office and warehouse.

Gordon Baking Co. will complete soon a new milk condensery at Salamanca, N. Y. The plant will have capacity for handling 200,000 lb. of milk daily, the condensed product being used in the company's Long Island bakery.

Kerr Milling Co., Nashville, suffered loss estimated at $150,000 on April 30 when fire swept through its plant. The fire also damaged the Freeland Milling Co. and Royal Flour Co. factories.

Lamont, Corliss & Co., New York, has purchased the physical assets, trademarks and good will of Siren Mills Corp., Chicago. L. P. Ely, president of Siren Mills, has become manager of sales of the Siren division of Lamont, Corliss. The Siren plant in Chicago is being dismantled and the production and laboratory equipment transferred to Fulton, N. Y. The Manhattan plant continues in operation, for the time being, at least.

National Biscuit Co. has started construction of a $75,000 building at Houston, Tex.

Quaker Oats Co. will construct a $500,000 addition to its grain elevator facilities at Akron, Ohio. The company plans twenty new concrete bins, 118 ft. high.

A. A. ACKLIN

He has been elected president of Coca-Cola Co., Atlanta, Ga. Mr. Acklin has been with the company since 1925 and has served as vice-president and treasurer and as president of Coca-Cola Export Corp. He succeeds Robert W. Woodruff, who has been named chairman of the board and chairman of the executive committee.

Rath Packing Co., Waterloo, Iowa, will lease a new $125,000 meat packing plant being built at Seattle, Wash., by the Union Pacific R. R. Co.

Shust Baking Co., Saginaw, Mich., an affiliate of Loose-Wiles Biscuit Co., will build a three-story plant to provide a 50 per cent expansion of production facilities.

Snider Packing Co. will modernize its plant and equipment at Fulton, N. Y., at a cost of $100,000.

A. E. Staley Mfg. Co., Decatur, Ill., will build a $300,000 soy bean processing plant near Painesville, Ohio.

Stokely Bros. & Co. suffered losses at Superior, Wis., on May 6, when fire burned the city-owned plant which the company operated. Estimates placed the damage to the building at $100,000 and to equipment and stock at $400,000.

John G. Woodward Candy Co., Council Bluffs, Iowa, has been taken over by Fenn Bros., Inc., Sioux Falls, S. D.

PERSONNEL

R. J. Blair, former manager of Nestle's Milk Products, Inc., at Weyauwega, Wis., has become president and general manager of Neenah (Wis.) Milk Products Co.

L. A. Bletzer is the new president and general manager of Gridley Dairy Co., Milwaukee, succeeding Lester Le Feber.

Dr. A. E. Cliffe, formerly with Quaker Oats Co., is now in charge of production and sales work on a new line of products for Ogilvie Flour Mills, Montreal.

Lewis A. Cushman, Jr., recently named chairman of the board of Purity Bakeries Corp., Chicago, has been elected president to succeed M. L. Molan, who has resigned. Mr. Molan will continue on the board of directors.

Arthur G. Dunn, of Arthur G. Dunn, New York importer, is the new president of American Spice Trade Association.

A. L. Durand, Hobart, Okla., heads up National Cottonseed Products Association.

Bradford C. Edmands, general manager of H. D. Foss Co., Boston, has been elected president of New England Manufacturing Confectioners Association.

Ray C. Gralow has been transferred from the technical service department of Corn Products Refining Co., Argo, Ill., to the new products division in New York.

Jake Grasmick, Grand Island, has been named president of Nebraska Bakers Association.

Henry Hagen has resigned as Libby, McNeill & Libby plant superintendent at Dorchester, Wis., to accept a similar position with Marshfield (Wis.) Canning Co.

John S. Hardy, Gainesville, has been elected president of Texas Bakers Association.

E. G. Hinton has been transferred as general manager for Armour & Co. at Los Angeles to a similar position at the Omaha plant. He succeeds E. S. Waterbury, who retired after 43 years of service in the packing industry.

W. H. Hoodless, vice-president of Pennsylvania Sugar Co., Philadelphia, succeeds the late J. A. McCarthy as president.

E. E. Hughes, for 47 years with Armour & Co.'s canned foods department in Chicago and for the past fifteen years in charge of the evaporated-milk division, has retired. He has been succeeded by C. E. Pierce.

Wilbur Jackson, district manager of the Hudson, Mich., plant of Pet Milk Co., has been transferred to Janesville, Wis. Ralph Fenstermacher, Greenville, Tenn., has been appointed to the Hudson post.

Earl Keller, of Clyde, heads up Kansas Bakers Association.

John J. Riley has been appointed secretary of American Bottlers of Carbonated Beverages. He has been on the A.B.C.B. staff since 1924 and was assistant to the late Junior Owens for several years.

T. H. Robertson, vice-president of Associated Biscuit Co., Inc., Salamanca, N. Y., succeeds J. E. Davidson, who has resigned as president and director.

Stanley M. Ross, cofounder of Moores & Ross Co., Columbus, Ohio, which was later acquired by Borden Co., has retired as chairman of the Midwest division of Borden Co. He is succeeded by Norval D. Goss, formerly vice-chairman.

Paul Schleicher, formerly superintendent of Rock County Sugar Co., Janesville, Wis., has been named to a similar post with Lake Shore Sugar Co., St. Louis, Mich.

Clyde A. Shurtleff, manager of the Salt Lake City plant of Continental Baking Co., has been appointed manager of the company's branch at Sacramento, Calif.

William H. Valderploeg, of Harris Trust and Savings Bank, Chicago, has been elected executive representative of W. K. Kellogg Co., Battle Creek. His appointment follows the resignation of Walter C. Hasselhorn as vice-president and general manager.

William Weber heads the new packaging division of Cudahy Packing Co., Chicago. Mr. Weber redesigned the Old Dutch Cleanser label, a Wolf Award winner.

C. J. Werner succeeds the late Arthur J. May as manager of the Manchester, Iowa, branch of Hutchinson Ice Cream Co., a Borden Co. subsidiary.

Benjamin J. Zenlea, formerly chief chemist of Walter Baker & Co., Inc., Dorchester, Mass., has returned to Rockwood & Co., Brooklyn, N. Y. He is engaged in research on products and plant processes.

DEATHS

Wiley V. Ambrose, president and general manager of Westgate Sea Products Co., San Diego, April 25.

Charles S. Pillsbury, 61, director of Pillsbury Flour Mills Co., May 25, at Rochester, Minn. Mr. Pillsbury was elected a vice-president of the company in 1910.

Charles F. Hartmetz, 70, chairman of the board of Sterling Brewers, Inc., Columbus, Ohio, April 19.

David Holm, 84, formerly operator of Standard Dairies in Nebraska, at Lincoln, recently.

H. A. Philliber, proprietor of Punxsutawney (Pa.) Beef & Provision Co., recently.

J. J. Cook, secretary-treasurer of Johnson Biscuit Co., Sioux City, Iowa, May 13. He had been with the company 31 years.

William Pitt Porter, 86, founder of East Jordan (Mich.) Canning Co., April 25.

William W. Remington, 75, former president and general manager of National Milling Co., at Minneapolis, April 17.

Andrew and William J. Robinson, brother partners of Robinson Brothers Bottling Co., Dover, N. H., which they started about 40 years ago with a third brother, Thomas, recently, within 24 hours of each other.

William E. Savage, president of Imperial Grain & Milling Co., Toledo, Ohio, April 24.

Jasper D. Tousley, 74, candy manufacturer who had been superintendent of Arbuckle Candy Co. and Crystal Confectionery Co. before starting his own business, at Burlington, Vt., recently.

ASSOCIATED INDUSTRIES

Allis-Chalmers Mfg. Co., Milwaukee, has named Walter Geist, vice-president.

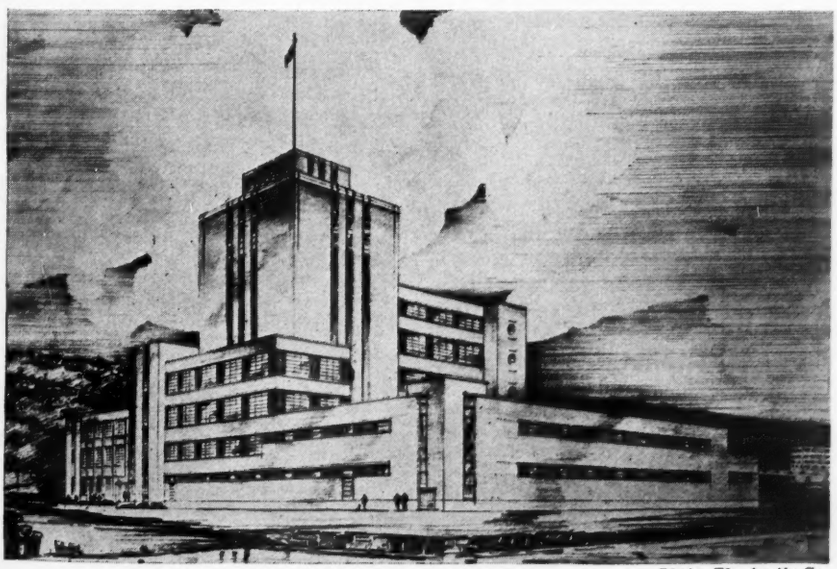
Buffalo (N. Y.) Foundry & Machine Co. has promoted Edward V. Hegg to manager of the New York office.

Chisholm-Ryder Co., Inc., Niagara Falls, N. Y. has opened a Chicago office with A. W. Kane in charge. The company recently took over American Utensil Co.

International Nickel Co., Inc., has established a new field office in New York to promote the use of nickel alloy steels. The office is under the direction of J. W. Sands.

Link-Belt Co. will construct a new office and warehouse building at Dallas, Tex.

Westinghouse Electric & Mfg. Co. has elected Marvin W. Smith vice-president in charge of engineering activities. W. F. White has been appointed manager of the lighting division and R. B. Mildon has been transferred to the Pittsburgh headquarters to assume special sales assignments.



Photo, The Austin Co.

SKYSCRAPER COFFEE PLANT

Hills Bros. Coffee, Inc., will build a modern plant, with 225,000 sq.ft. of floor space, at Edgewater, N. J. Of brick, concrete and steel construction, the plant will have a fourteen-story mixing tower and will house facilities for unloading, roasting, packing and shipping coffee. The plant will overlook the Hudson River.

The Plant Notebook

How to Handle Viscous Products

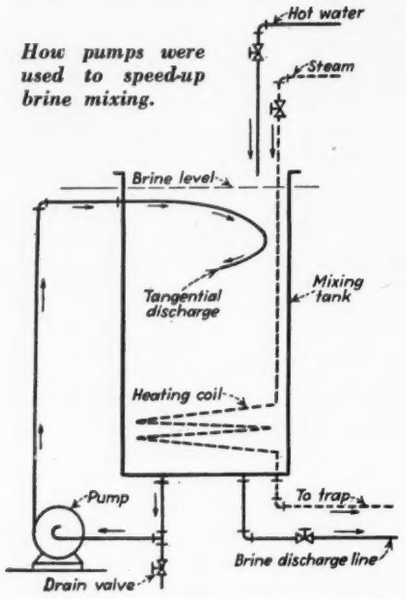
Food products that are highly viscous or sticky present a difficult problem in handling, for there is a heavy frictional load on any surfaces coming in contact with them. In general, it may be said that there are two ways to go at the handling of such materials. One is to reduce the area of surfaces coming into moving contact with them, and the other is to reduce the viscosity of the materials by raising their temperature.

There is, of course, the expedient of adopting the use of greater power in mechanisms better fitted for such work, a case in point which will serve to illustrate this being the rotary type of pump. The rotary pump is successful in the transfer of very viscous materials, because it has a very high discharge pressure which will help to overcome the high frictional load on piping. In the case of materials so highly viscous that they become solid or semi-solid at ordinary temperatures, the use of a steam-jacketed pump is often indicated, such a provision liquefying the material sufficiently to be of considerable aid in moving it.

With reference to the reduction of contact areas spoken of, an instance of this principle is found in the handling of molasses and similar stock with the spiral ribbon type of conveyor. This is really a screw-type conveyor made in open form, substituting a spiral ribbon of steel for the solid screw of the ordinary type, and is used to high advantage where the transfer of such materials is necessary.

Pumps Solved Mixing Problem

During a recent bumper crop season, a mid-western cannery found it necessary to operate for extended periods of time well above its designed output. Although this unexpected condition demonstrated the ability of the plant as a whole to absorb sustained overloads, it was discovered that inadequacy of brine making facilities prevented other steps of the process from developing much-needed full productive capacity. In order that this additional capacity could be made available in as short a time as possible, it was necessary to employ a number of temporary expedients to increase the brine output from existing mixing and heating equipment, which consisted of open tanks equipped with heating coils,



How pumps were used to speed-up brine mixing.

but having no means of mechanical stirring or agitation.

As a satisfactory means of mechanical agitation was not at hand, the problem of thorough mixing was solved with centrifugal pumps borrowed from an idle section of the plant. As shown in the drawing these pumps were arranged to take their suction from the bottom of the tanks and to discharge at relatively high velocities through piping extending tangentially into the top of the vessel. This method of discharge sets up a swirling action and insures thorough mixing of the relatively highly concentrated bottom liquid with the whole contents of the tank and also avoids accumulations of undissolved sugar and salt in the vicinity of the finished brine discharge line. Another advantage of this method of agitation is the increased effectiveness of the tank heating coils.

Cost of Steam

Every food plant operator who uses steam should be familiar with Napier's famous "steam flow rule." It should be jotted down, or, better still, memorized.

Napier's very simple and valuable rule is a basis for many computations pertaining to the use of steam. It is applicable to any problem where steam flows directly from high boiler pressure into the atmosphere, as for heating, creating draft in furnaces, in soot blowers, oil burner atomizers, and so on.

This is the rule as applied to steam flowing through a given opening:— "To the steam gage pressure in pounds per square inch add 14.7. This gives the so-called 'absolute pressure.' Then multiply the absolute pressure by the area of the opening in square inches. Then divide by 70." The result is the weight of steam in pounds flowing through the opening every second.

So that the rule can be more readily applied to most actual cases of steam flow it has been converted into the following form: "Multiply the absolute pressure in pounds per square inch by the area of the opening in square inches. Multiply this result by the cost of coal per ton. Then multiply that by 0.257 and into the result divide the number of pounds of water evaporated into steam in the boiler or boilers per pound of fuel." The result is the cost of the steam flowing through the opening in dollars per ten-hour day.

As an example: What is the cost per ten-hour day of steam flowing through a ½ in. round opening for creating draft in a furnace where the gage pressure is 100 lb. per sq. in.? Fuel costs $4 per ton; and 8½ lb. of water are evaporated into steam per pound of coal.

By means of tables or by computation it is easy to find that the area of the ½ in. round opening is 0.196 sq.in. Then substituting in the above rule it will be found that the cost of the steam is $2.72 per ten-hour day.

For instance where oil is the fuel, the rule has been converted into the following form: "Multiply the absolute pressure in pounds per square inch by the area of the opening in square inches. Then multiply that by the cost of the oil in dollars per gallon. Then multiply that by 64.3 and into the result divide the number of pounds of water evaporated into steam in the boiler or boilers per pound of oil." The result is the cost of the steam flowing through the opening in dollars per ten-hour day.

Just off the Press

BOOKLETS • LITERATURE • BULLETINS

Food Plant Equipment

CANNING EQUIPMENT — General Catalog No. 500, published by Sprague-Sells Division, Food Machinery Corp., Hoopeston, Ill., on modern canning machinery and supplies, contains 223 pages, complete with illustrations, index, statistical data and specifications, applications and descriptions, including information on the new machines: cob corn trimmer, tenderometer, crusher preheater, super coils, juice fillers, pulp fillers, liquid fillers, syrupers and briners, 12-station soup filler, single valve fillers, continuous asparagus cutter and continuous vegetable peeler.

CONTROL AND PROCESSING EQUIPMENT—"For Better Liming and Gassing of Beet Juices," to specified pH, Bulletin N-96S-709B, and "Condensate Purity Instruments for the Steam Plant," Catalog N-95-163, for power generation or for process use, have been published by Leeds & Northrup Co., 4907 Stenton Ave., Philadelphia, Pa.

DRYING AND HANDLING EQUIPMENT —The Roto-Louvre dryer for cooling and drying foods, and conveyors for handling things mechanically overhead, are announced in Bulletins No. 1711 and 1630 respectively, by Link-Belt Co., 307 N. Michigan Ave., Chicago, Ill.

MATERIALS HANDLING EQUIPMENT —Car pullers, hoists and winches are described and illustrated in Catalog 7738 by Stephens-Adamson Mfg. Co., Aurora, Ill.

OIL PROCESSING EQUIPMENT—Filtrol activated clays for use in the processing of animal and vegetable oils are discussed in a 32-page illustrated bulletin recently published by Filtrol Corp., 315 W. Fifth St., Los Angeles, Calif.

PROCESSING EQUIPMENT — Bulletin No. 100-B13 on inert gas generators for industrial applications and fire and explosion prevention, and supplementary Bulletin No. B14-HB covering horizontal boiler service units up to 500 hp., have been published by Roots-Connersville Blower Corp., Connersville, Ind.

REFRIGERATING EQUIPMENT—Application of low temperature cold plates for use in refrigerated trucks, ice cream cabinets, hardening rooms, coolers, and soda fountains are discussed in a recent catalog by the Dole Refrigerating Co., 208 N. Clinton St., Chicago, Ill.

REFRIGERATING EQUIPMENT—Bulletin No. 112-F on enclosed-type ammonia compressors; "Air Conditioning and Refrigeration in New England and Manhattan"; and "Flexo-Seals for Enclosed-Type Ammonia and Freon-12 Compressors"; have recently been published by Frick Co., Waynesboro, Pa.

Plant Accessories and Supplies

BEARINGS—Johnson Bronze Co., New Castle, Pa., has issued its 72-page 1939 Catalog No. 390, giving complete sleeve-bearing information and illustrations of stock sizes.

CASTINGS — Data on corrosion-resistant alloy castings is given in Booklet 108 complete with illustrations, specifications and application, by Michiana Products Corp., Michigan City, Ind.

COMPRESSOR — Ingersoll-Rand Co., Phillipsburg, N. J., has issued a 16-page illustrated Bulletin No. 3072 dealing with the new heavy-duty, diesel-engine driven compressor, Type "XVO," for use in ice and cold storage plants.

DIESEL ENGINES—Caterpillar Tractor Co., Peoria, Ill., has issued its 1939 catalog illustrating tractors, road machines and Diesel engines; a 14-page illustrated bulletin on "Caterpillar" track-type tractor; and "Caterpillar Craftsmanship" dealing with manufacturing processes.

ELECTRICAL EQUIPMENT — Diehl Manufacturing Co., Elizabethport, N. J., has issued Catalog No. 31, containing information and application data on motors, generators and fans with prices listed.

ELECTRIC MOTORS—A new motor application chart, Bulletin No. 515, issued by The Louis Allis Co., Milwaukee, Wis., lists 26 types of motors recommended for about 50 standard applications.

ICING-EQUIPMENT—Link-Belt Co., 307 N. Michigan Ave., Chicago, Ill., has published a 4-page illustrated Folder No. 1716 on its line of ice crusher-slingers on motor trucks for team track top-icing of fresh vegetables.

INDUCTON MOTORS—Allis-Chambers Manufacturing Co., Milwaukee, Wis., has issued an 8-page illustrated Bulletin No. 1195 on squirrel cage electrical induction motors and their industrial application.

INDUSTRIAL TRUCKS—Bulletin A-8416 on Type EP-10 low lift platform truck and Bulletin A-8459 on Type ELN-10 high lift platform truck, have been issued by The Elwell-Parker Electric Co., Cleveland, Ohio.

POWER PLANT EQUIPMENT—Data on sizes, ratings, specifications and dimensions of power pumps, and application of hydraulic tube washers for surface condensers are given in Bulletins W-423-B5 and W-200-B4, respectively, by Worthington Pump & Machinery Corp., Harrison, N. J.

PUMP—"Motoair," a motor and pump in one integral unit, is described with illustrations and specifications, by Motoair Division, N. J. Machine Corp., 1505 Willow Ave., Hoboken, N. J., in a recent bulletin.

SHIPPING EQUIPMENT—Diagraph-Bradley Stencil Machine Corp., 3745-51 Forest Park Blvd., St. Louis, Mo.,

has published a 48-page illustrated catalog, entitled the "Shippers' Handy Helper," listing various supplies and devices used in packing and shipping departments.

STEEL EQUIPMENT — Joseph T. Ryerson & Son, Inc., 203 Westside Ave., Jersey City, N. J., has published a 28-page book on steel and allied products carried in Ryerson stock, and a folder covering Taylor alloy steel sling chains.

STOKERS—Detroit Stoker Co., Monroe, Mich., has issued a 16-page illustrated Bulletin No. 140, listing a complete line of stokers for high furnace temperatures.

UNIT HEATERS—Bulletin No. S327, published by The Trane Co., La Crosse, Wis., deals with the various types of unit heaters available for commercial application in bottling plants, laboratories, distilleries, breweries, shipping rooms and industrial buildings.

VALVES—Bulletin B-420 describing blow-off valves for low and medium pressure boilers, and Bulletin B-430 dealing with blow-off valves for high pressure boilers, have recently been made available by Yarnall-Waring Co., Chestnut Hill, Philadelphia, Pa.

Packaging

COLLAPSIBLE TUBES — Collapsible tubes for the packing of products, made from tin and lead alloy, are the subject of a pocket-size, illustrated booklet of the National Collapsible Tube Co., Providence, R.I.

PACKAGING—White Cap Co., 1812 N. Central Ave., Chicago, Ill., has full color spreads available showing glass containers entered in the National Canners' Convention, 1939, which were vacuum sealed with its vapor-vacuum caps.

PACKAGING MACHINERY—Stokes & Smith, Co., 4926 Summerdale Ave., Philadelphia, Pa., has issued Form 4926 dealing with fillers, packaging machines, conveyors, wrappers and sealers.

SHIPPING CONTAINERS — Various types, sizes and decorations are illustrated and described in a 23-page Bulletin No. X 181, entitled "Steel Shipping Containers," published by Wheeling Corrugating Co., Wheeling, W. Va.

Trucks, Tractors and Accessories

TRACTORS—Track-type tractors used from plowing through to harvesting operations in potato and beet fields are described in a 23-page illustrated booklet by the Caterpillar Tractor Co., Peoria, Ill.

TRUCKS—Marmon-Herrington Co., Inc., Indianapolis, Ind., has issued an illustrated Form No. 390105-1 dealing with 4 and 6 all-wheel-drive Ford trucks especially designed for tough going.

Control Equipment

CONTROL EQUIPMENT—Control apparatus, rheostats and resistors with illustrations, specification and application data are listed in a recent catalog by Schaefer Bros. Co., 1059 W. Eleventh St., Chicago, Ill.

CONTROL EQUIPMENT—"Marvels of the Electric Eye," published by United Cinephone Corp., Cinephone, N. Y., discusses photo-electric control equipment for use in food processing, safety, industrial and illumination control.

CONTROL EQUIPMENT—Potentiometer controllers for governing industrial temperatures are described in Bulletin 202-2 by The Foxboro Co., Foxboro, Mass.

CONTROL INSTRUMENTS—A complete line of indicating, recording and controlling instruments for measuring and controlling temperatures, pressures, flows, liquid levels and humidity is the subject of Folder No. G-37, published by The Brown Instrument Co., Wayne & Roberts Aves., Philadelphia, Pa.

TEMPERATURE CONTROL—Sarco Co., Inc., 183 Madison Ave., New York, N. Y., has announced Type SE self-contained electric temperature regulator suitable for any temperature between –40 F. and +650 deg. F., in its recent bulletin.

THERMOMETERS—"Tag" dial thermometers, equipment for breweries, diesel engines, and bakery machines are described in detail by C. J. Tagliabue Mfg. Co., Park and Nostrand Aves., New York, N. Y. in catalog No. 1170.

Materials of Construction

CEMENT—"Hytempite" for use as a binder for fire brick, silica brick or granular refractories in brick-lined bake ovens, is described in Catalog H. G. 501, published by Quigley Co., Inc., 56 W. 45th St., New York, N. Y.

ENGINEERING MATERIALS—"Heavy Duty Truck, Bus and Diesel Starting Batteries" with construction features and specifications; and "Rubber as an Engineering Material," a 25-page plastic bound publication, have recently been issued by The B. F. Goodrich Co., Akron, Ohio.

METAL—"Glyco Bearing Metal," title of an 8-page illustrated bulletin of Joseph T. Ryerson & Son, Inc., 16th and Rockwell Sts., Chicago, Ill., deals with the characteristics and application of Babbitt metal.

Miscellaneous

CLEANING EQUIPMENT—A 19-page illustrated booklet on protecting bakery product quality through cleaning and sterilizing methods, and an 8-page illustrated booklet on solution-lifting steam guns for use in food plants, have been published by Oakite Products, Inc., 22 Thames St., New York, N. Y.

CLEANSERS—Twelve different industrial uses are illustrated for six types of Metso cleaners on a cleaning directions meter issued by Philadelphia Quartz Co., Philadelphia, Pa.

RECORDS—The Acme Card System Co., Suite 2001, 8 So. Michigan Ave., Chicago, Ill., announces flexoline visible record equipment for keeping single-line records, listings and indexes, in Bulletin No. 41.

RESEACH—The research program carried on in laboratories by Crane Co., 836 S. Michigan Ave., Chicago, Ill. for the investigation of welding, metallurgy, radiography, industrial products, ceramics, sanitation and hydraulics, heating and air conditioning, basic sciences and photography is discussed in a recent 48-page illustrated booklet entitled "Crane Research Laboratories."

SAFETY SHOES—Forty-one styles of steel toe safety shoes for reducing the number of foot injuries in industry are described and illustrated in a catalog issued by Lehigh Safety Shoe Co., Allentown, Pa.

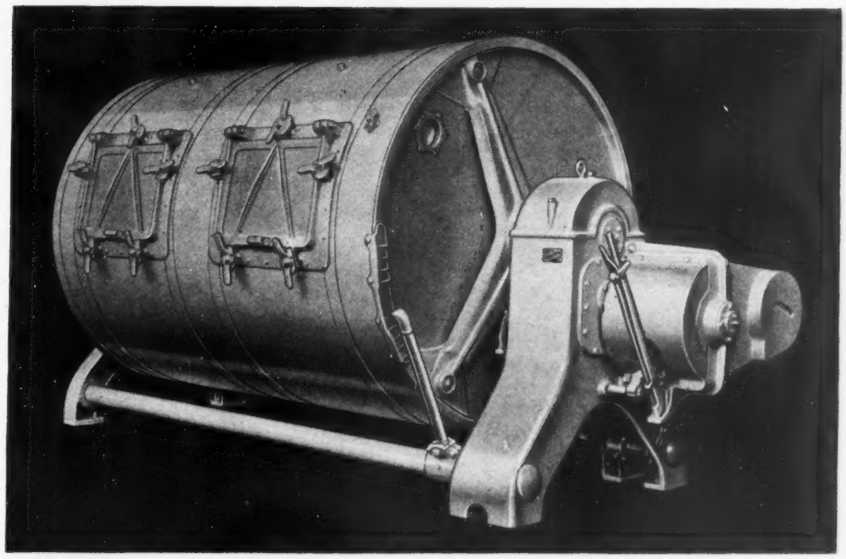
SOIL TREATMENT—Innis, Speiden & Co., 117 Liberty St., New York, N. Y., has issued reprints of trade paper articles on chemical soil fumigation and the commercial use, characteristics and advantages of chlorpicrin as a fumigant.

Food Equipment News

REVIEW OF FOOD PROCESSING EQUIPMENT, ACCESSORIES, AND SUPPLIES

No-Roll Churn

THE CREAMERY PACKAGE MANUFACTURING Co., 1243 W. Washington Blvd., Chicago, Ill., is manufacturing the "No-Roll" churn. This machine is designed with three fixed peripheral worker sets that are coopered right in the barrel. Among the advantages claimed for it are the elimination of rolls, roll gears and roll bearings; the production of a sanitary barrel with no crevices and with every part of the interior easily accessible for thorough cleaning; an improved section; a new type of barrel suspension; the elimination of bolt-heads from the interior and the elimination of driving strain on the head; and ease of handling and operation.



No-Roll churn.

Metal Cleaning Pad

FOR USE in scouring the surfaces of food processing equipment made of stainless steel, glass-lined steel, nickel, Monel metal or other materials, Metal Textile Corp., Orange, N. J., has developed "Metex," a woven metal pad made of 4,000 ft. of pure nickel continuous ribbon. This pad is woven in the shape of a mitt for convenience in handling. It is constructed with a locked stitch to prevent it from getting frayed or ragged. When dirty it can be cleaned by washing with lye or other suitable solvent, as the nickel pad resists corrosion from these materials.

Cleaning pad of woven nickel ribbon. Smaller pad shown is of Monel metal and is primarily for domestic use.

Can Temperature Tester

TAYLOR INSTRUMENT COMPANIES, Rochester, N. Y., has developed a can temperature testing machine for determining the temperature in the center of a can of food immediately upon removal from the retort or cooker. This device is said to assure recording of the temperature in the center of the can by exact centering of the thermometer and avoidance of stirring of can contents. It is also said to be safe to operate without danger of burns to the operator. This device is adaptable to all sizes of round cans. A range of 140 to 220 deg. F. is provided.

Bottle Corker

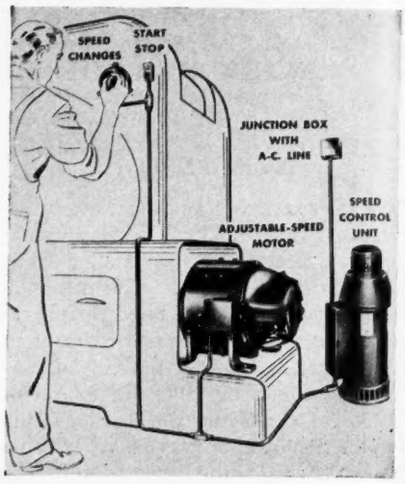
HORIX MANUFACTURING Co., Corliss Sta., Pittsburgh, Pa., has developed a semi-automatic bottle corker that can be used with any standard chain conveyor. This machine places all sizes and types of tapered corks and can be used with some straight corks. Its output is limited only by the skill of

the operator and the number of operators employed in starting corks in the containers.

This machine is readily adjusted for various heights of bottles and can be attached to any standard chain conveyor. It consists of an endless belt running over pulleys and synchronized with the conveyor. A rigid metal plate behind the moving belt forces the corks firmly and evenly into the bottles. One or more operators, standing alongside the conveyor, between the filler and the corker, place the corks loosely in the openings of the filled bottles as these move by on the conveyor.

Electric Variable Speed Drive

Wide variations in speed, with flexible control and full torque at all speeds, are provided by a new all-electric machine drive developed by Reliance Electric & Engineering Co., Cleveland, Ohio. Speed variation of 12 to 1 is available in standard units, and for short operation a range of 20 to 1 or more is practicable. Speed changes can be made while the drive is operating merely by turning the knob of the speed-control rheostat. Regenerative braking slows the speed of the driven machine when the rheostat is turned for slower operation.



All-electric variable speed drive

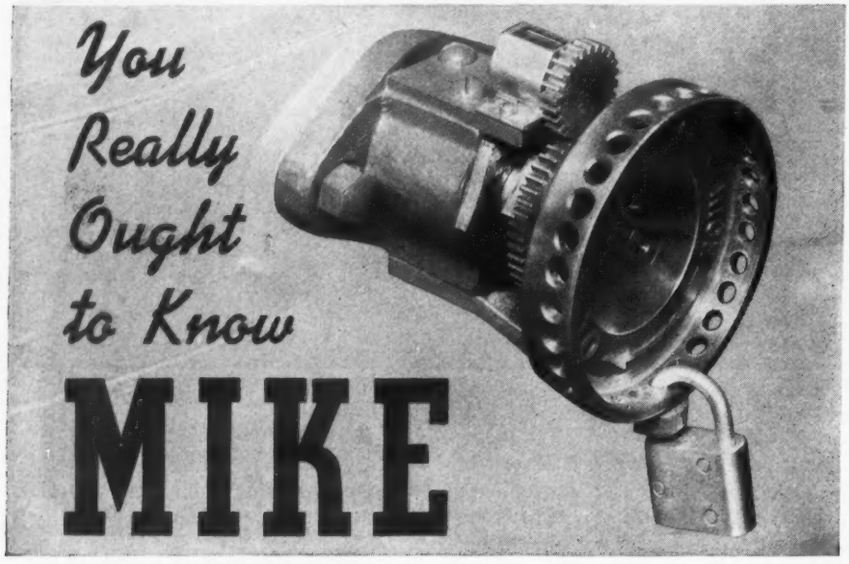
The new drive involves no new principles, but is a special adaptation of a direct-current motor operated from a motor-generator set connected to the alternating current power supply, with control obtained by varying the voltage supplied by the motor-generator to the motor. The motor-generator set is on a vertical shaft, along with an exciter, the whole unit being about the size of a "fire plug" and taking a floor space only 18 in. square for a 7½ hp. motor. The speed adjusting rheostat is an industrial application of the design used in the radio field, so that it has an unlimited number of speed-control positions and is small enough to be mounted conveniently near the push button start-and-stop control for the motor.

The machine-drive motor, a d.c. unit specially designed for this application, is available in fan-cooled, splash-proof and explosion-proof types, and also as a gear motor. The a.c. motor driving the generator operates from 220, 440 or 550 volt, 60 cycle, three phase current.

This control makes available for use with small motors, as small as 1 hp. or less, a "packaged" variable speed, direct current drive which is low in first cost, simple in installation and requires little space.

Corrosion Resistant Alloy

COLONIAL ALLOYS Co. Philadelphia, Pa., is marketing a corrosion resistant alloy that is said to be particularly suited to the fabrication of food proc-



Mike is *some* watchman! Mike never needs a cup of coffee, has no curiosity, never gossips, never gets drowsy, never asks for a relief, never ducks for a smoke, never moves without authority.

Mike *really watches* heating operations in high temperature cooking, roasting, baking and can making, and watches the gas bills, too! Mike is the micrometer adjusting wheel that controls the valve action of the Kemp Industrial Carburetor, which in turn provides 100 percent premixing of gas and air, allowing accurate automatic control of flame pressure and flame characteristics, allowing flame application in enclosed chambers, *even in solutions* . . . with fuel savings of 15 to 50 percent. Like to hear more? Address **The C. M. Kemp Mfg. Co., 405 E. Oliver Street, Baltimore, Md.**

KEMP of BALTIMORE

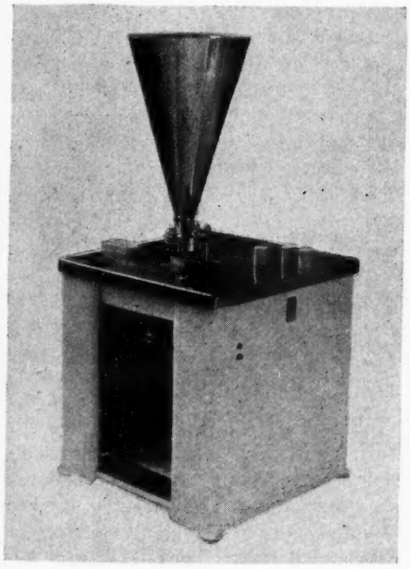
essing equipment. Called "Colalloy," this material is of non ferrous composition. It is said to be colorless, odorless, non-toxic, and tasteless, and will not, it is further claimed, contaminate even the most sensitive food materials.

This metal is available in all standard forms. It is light in weight, strong and easily workable.

Vacuum Filler for Powders

A VACUUM FILLING MACHINE for volumetric packaging of dry, finely divided products with a guaranteed accuracy of ± $\frac{1}{16}$ oz. on a ½-lb. pack and of ± $\frac{1}{8}$ oz. on a 2-lb. pack has recently been put on the market by Modern Packaging Machinery Co., Danville, Ill.

It consists essentially of a feed hopper fitted to a five-valve filling head adjustable in height above table level for height of package, a package holding station capable of being raised and lowered above table top to make and break air-tight contact with under surface of filling head containing the filling nozzles and suction ports, and a reciprocating pump which operates the five poppet valves on an alternating suction and pressure cycle to fill container and to clean the fine screens covering the suction ports.



Vacuum filler for powders.

The weight in a given sized container is determined by the density of the pack controlled by the amount of suction on the feed. The suction on the feed, in turn, is governed by the regulating adjustment on the machine convenient to the operator. Cocoa and mustard powders, spices and condiments, powdered malted milk, and dessert mixes are among the products claimed to be packaged at the rate of 200 to 250 containers per minute regardless of volume content.

The machine units are the same for ¼-oz. paper boxes as for 2-lb. cans or jars excepting the filling heads and the enclosing shrouds for porous fiber containers or non-air-tight cans. A predetermined rate of filling under a given suction is obtained by varying the number of nozzles in the filling head to correspond with the size of container to be filled. An agitator in the feed hopper speeds up handling of slow-flowing powders.

When the container is of glass or air-tight metal construction, the use of a metal shroud around container to form a vacuum chamber is unnecessary. However, since all containers are filled by suction, the suction ports must be covered with a screen, as fine as 325 mesh for the extremely finely ground powders, to prevent drawing of the powders into the suction line

See them in action
at the NEW YORK WORLD'S FAIR

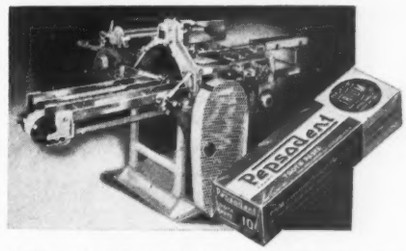
Model AA — Exhibited by the American Tobacco Company. Wraps comparatively small packages in glassine, waxed paper, transparent cellulose, etc. Adjustable for different sizes. Brings all folds and laps on narrow sides and ends of package.

Millions will be fascinated by the deft motions of these four wrapping machines at the exhibits of the American Tobacco Company, the Continental Baking Company, E. I. du Pont de Nemours & Co. Inc., and The Pepsodent Company.

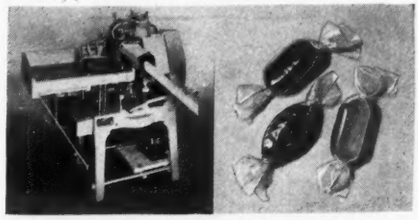
No mere "show pieces" to attract the crowd, these machines are day-in and day-out producers in manufacturing plants throughout the country. They are but 4 of our 78 types of machines—a line which covers virtually every wrapping requirement in modern industry.

Package Machinery Company machines embody the most advanced features for speed, economy, and flexibility . . . designed with an eye on tomorrow's needs as well as today's.

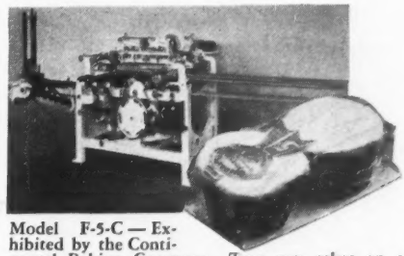
Put your Wrapping Problems up to us
Consult our nearest office



Model FA—Exhibited by The Pepsodent Company. A widely used carton wrapping machine—serves many different industries. Wraps an extremely wide range of sizes and shapes. Handles any type of wrapping material. May be equipped with Electric Eye for registration of printing.



Model 22-B—At the Du Pont exhibit. Wraps hard candies or soft center pieces individually in odd and fancy shapes. Does combination type wrapping (for example, inner wrapper in foil, outer wrapper in cellulose).



Model F-5-C — Exhibited by the Continental Baking Company. Two cup cakes on a card wrapped in transparent cellulose. Attaches a medallion for identification.

PACKAGE MACHINERY COMPANY, Springfield, Massachusetts
NEW YORK CHICAGO CLEVELAND LOS ANGELES
Peterborough, England: Baker Perkins Ltd. Melbourne, Australia: Baker Perkins Pty., Ltd.
Mexico, D. F., Apartado 2303 Buenos Aires, Argentina: David H. Orton, Maipu 231

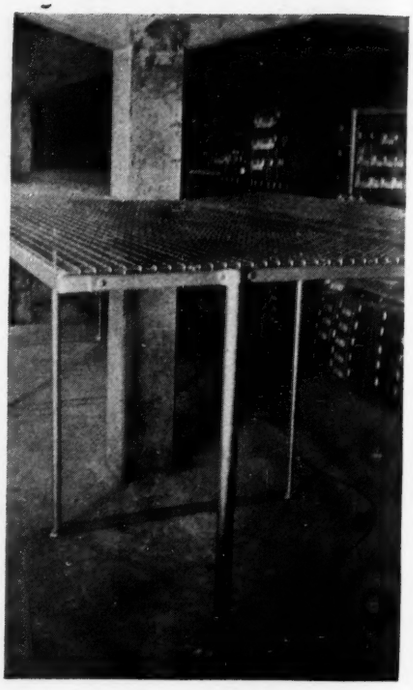
PACKAGE MACHINERY COMPANY
Over a Quarter Billion Packages per day are wrapped on our Machines

and pump. Trapping of any fine particles which do get by these screens is provided for. A small cyclonic separating chamber is fitted into the suction line. The material trapped in this chamber is not only kept out of the pump valves and air of the room but is also caught free from contamination and is suitable for return to the feed hopper. Operators do not have to wear masks nor is there any loss of the powders upon the floor.

All working parts may be of non-corrosive materials when desired. Stainless steel is standard for table top, filling nozzles, and screens for suction ports.

Mezzanine Flooring

INCREASING STORAGE, stock or shipping room capacity without increasing present floor area is the purpose of the "Mezzanine Storage Floor" arrangements developed by Superior



Mezzanine flooring

Wire & Iron Products, 1051 E. 76th St., Chicago, Ill.

Floor of mesh is of self-interlocking construction for rigidity and has flush surface. Mesh is supported on high carbon steel channel frames reinforced by channel spaces at 1 ft. intervals. Flooring will support 70 lb. per sq.ft., is held at any desired height by steel pipes, or can be laid directly on loading floor to prevent moisture damage.

Fabricated in sections to size and shape best suited to installation, the structure permits easy dismantling for relocation or rearrangement. Open steel flooring does not interfere with sprinkler system operation or air circulation, and allows passage of light.

Elevating Devices

ROTARY LIFT CO., Memphis, Tenn., are making the "Levelator" and the "Tabelator." These are designed for a lift of 30 ft. or less, to handle material between floors and eliminate the need for ramps. They are also used to elevate loads for placing in freight cars and trucks. These elevators operate on the hydraulic principle, using oil as the fluid medium. Pump operation is by electric motor or air. Control can be by hand lever at the power unit, by a pull-rope, or by push buttons at convenient locations.

Anti-Rust Coating

FOR PROTECTION of clean or rusted metal surfaces from rusting, Rustvoid

Reduce YOUR MIXING COSTS THE SANITARY "LIGHTNIN" WAY

Replace Paddle Type Agitators

It has been repeatedly proved that LIGHTNIN Patented Double Action Propeller Type Mixing cuts power costs, reduces mixing time and entirely eliminates dead-spots. Complete line includes geared and direct drive portables, top entering and side entering mixers for mixing quantities from one to one million gallons. Completely sanitary. No pockets for bacteria. Easily cleaned with hot water or steam. Sanitary sealed out-board bearing prevents oil or grease from this source contaminating mix.

"Lightnin" Variable Speed Mixers operate from 100 to 1800 R. P. M.

"Lightnin" Portable Mixers (geared and direct drive) range in size from 1/30 to 10 H. P.

"Lightnin" Top Entering Units (geared and direct drive) for open or closed tank work including pressure and vacuum work.

"Lightnin" Side Entering Units for tanks up to 1,000,000 gals.

"LIGHTNIN" SAVES MONEY MIXING

Carbonated Beverages
Tomato Products
Fruit Juices—Jellies—Jams
Preserves—Lard—Milk
Ice Cream Mix—Milk Drinks
Buttermilk—Bakery Supplies
Soups—Brines—Syrups
Vinegar—Wines
Yeast Products—Flavorings
Fruit Pulp—Extracts
Vegetable Dyes—Baby Foods
Premixing Mayonnaise and Salad Dressings
Sherbet—Honey
Beer—Distilled Spirits
Meat Sauces—Vegetable Oils
Vegetable Butters
Mincemeat—Cod Liver Oil

MIXING EQUIPMENT CO., INC.
1043 Garson Ave., Rochester, N. Y.
Please send me:
☐ Bulletin B-65—Portable Mixer.
☐ Bulletin B-63—Top Entering Mixer.
☐ Bulletin B-62—Side Entering Mixer.
☐ Mixing Equipment Work Sheet.

Name_____
Title_____
Company_____
Address_____

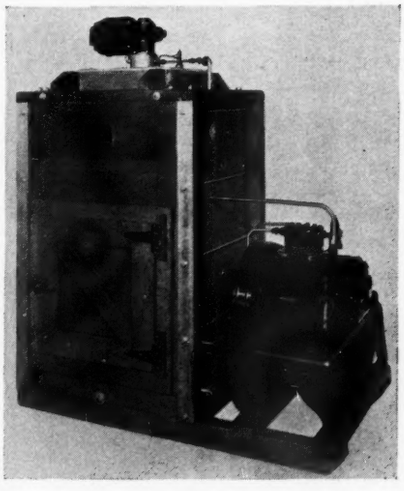
MIXING EQUIPMENT CO., INC.
1043 Garson Ave., Rochester, N, Y.

MANUFACTURERS OF LIGHTNIN PROPELLER TYPE MIXERS

Products, Inc., 30–30 Northern Blvd., Long Island City, N. Y., has developed a coating called "Rustvoid." This is applied to new surfaces after removal of scale and dirt, or to rusted surface after removing heavy rust, loose paint, oil, grease and dirt. It is applied by spray gun or brush in thin coats. One or two coats are required. After use, the surface may be covered with aluminum paint (using Rustvoid as the vehicle) or with any good pigment, oxide or graphite paint. Cellulose lacquers should not be used.

Small-Size Icing Machine

VILTER MFG. Co., Milwaukee, Wis., has developed a ½-ton capacity "Pak-Icer" for use in the food industries where floor space or ice requirements are limited. This machine is a self-contained unit with compressor ice making unit and storage bin mounted on one frame. It requires only connection with a water line and a source of electric power in order to operate. Its floor space requirement is 3x5 ft. and its height is 6 ft. 6 in. In operation the icer produces the material in the form of a coarse snow and its operation and use are the same as the 1-ton and 2½-ton units now available.



Small size icing machine.

Food Law Legal Liability

(*Continued from page 329*)

the law. Moreover, the General Enforcement Regulations already issued by the Food and Drug Administration indicate that a guarantee in order to be effective must refer specifically to these sections. (See INFORMATION LETTER No. 726, Dec. 31, 1938, pp. 5703, 5706.)

While the guarantee can in no way relieve the canner from his primary responsibility as shipper, the giving of *false* guarantees is specifically made a misdemeanor [Sec. 301 (h)]. In addition, the canner is civilly responsible on his guarantee.

Recommended Approved Form of Federal Law Guarantee

The following form of guarantee has been recommended by the Conference Committee for inclusion in all sales contracts:

"Seller guarantees that none of the articles of food sold under this contract will be adulterated or misbranded within the meaning of the Federal Food, Drug and Cosmetic Act of June 25, 1938, and that such food will not be produced or shipped in violation of Sec. 404 or 301 (d) of said Act; provided, however, that the seller does not guarantee against such goods becoming adulterated or misbranded within the meaning of said Act after shipment, by reason of causes beyond seller's control; and provided also that where goods are shipped under buyer's labels, seller's responsibility for misbranding shall be limited to that resulting from the failure of the product to conform to the label furnished by the buyer.

★ Cercon is an edible, tasteless wax suitable for coating food products requiring protection from the air.

It is supplied in six colors—Snowdrift, Lemon, Orange, Tangerine, Apricot, and Olive. It has an ASTM penetration of 50 with the 50 gram weight attached.

We will be very glad to send test samples to any interested company.

THE CONEWANGO REFINING CO.
WARREN, PENNSYLVANIA

Buyer undertakes to save seller harmless from any liability under said Act for any other type of misbranding arising out of the use of buyer's labels, or for any liability under said Act for misbranding where buyer insists upon the use of any label after seller has questioned in writing the use of such label."

The form set forth relates to a specific sale covered by a particular contract. Where a continuing or blanket guarantee is desired the beginning of the guarantee should read as follows:

"Seller guarantees that no articles of food sold by seller to buyer during the period in which this guarantee is effective will be adulterated . . ." (Remainder as in the form quoted above.)

Insofar as this recommended approved form applies to canned foods packed under the canner's own label, it requires no comment.

With respect to its application to canned foods packed and sold under labels supplied by the buyer, some further explanation seems warranted. Since the canner alone knows what has actually been enclosed in the container, it is only reasonable that he guarantee that the product conforms to the label which is affixed to the container. It should be carefully noted, therefore, that the second proviso in the first sentence of the recommended form in no way qualifies the canner's guarantee that the contents of the can conforms to the buyer's label, *irrespective of what representations are made on such buyer's label.* Indeed, any lesser guarantee would probably not suffice under Sec. 303 (c) (2).

Under the new federal law, however, there are a number of requirements concerning the *arrangement* on the label of information such as product name, ingredients, net weight, distributor name and place of business, etc. [Sec. 403 (f)] and regulations thereunder. See also *Information Letter,* No. 726, Dec. 31, 1938, p. 5706; No. 735, March 25, 1939, pp. 5778–79.) Accordingly, a product may conform strictly to the statements contained on the buyer's label but may nevertheless be deemed misbranded because of improper arrangement of the required information on that label. The sole effect of the second proviso in the first sentence of the recommended guarantee is to exclude from the canner's guarantee any undertaking *to the buyer* concerning the legality of the arrangement or form of the buyer's label, as distinguished from the correspondence between the label and the product. As already noted, this limitation relates only to the canner's responsibility to the buyer. It can in no way affect the canner's primary responsibility to the Government as shipper of the goods, which responsibility embraces every requirement concerning adulteration or misbranding including the arrangement of the particular label affixed to the container. In other words, where a canner ships under buyer's label he can be prosecuted by the Government for *any* defect in the label. If, however, the defect relates to any matter of arrangement, he cannot be prosecuted for giving a false guarantee nor, is he civilly liable to the buyer on the guarantee.

This limitation on what the canner guarantees in the first sentence of the recommended approved form, and the buyer's undertaking in the second sentence, become highly important in the event that there is a seizure of any shipment. In such cases, either the buyer or the seller may appear as claimant and either contest the seizure or (except in cases of adulteration of shipments in violation of the Emergency Permit provision) secure the re-

DOZENS IN JUNE
THOUSANDS IN AUGUST
DON'T LET PESTS FEED ON YOUR PROFITS
This pictorial chart indicates the tremendous rate of growth of insect pests in a sixty-day period unless controlled.
The insects in your plant can multiply hundreds of times over in a sixty-day period. A few in your plant now can become destructive hordes unless controlled.
Pennies used now on control with LIQUID HCN can save you many dollars two months from now. Fumigation with LIQUID HCN is the scientific method of killing all insects that infest flour, grain, rice, raisins, dates, figs, nuts, and other food products. It is the all-purpose destroyer. Powerful, concentrated, efficient, the preferred fumigant of scientific workers — Federal, State, and private. It kills both insects and larvae and also rids your plant or warehouse of rats and mice at the same time.
Cyanamid manufactures HCN in all its modern forms (LIQUID HCN, Commercially Pure; *CYANOGAS, *ZYKLON Discoids and CALCYANIDE). The members of our staff have long experience in pest control in all types of mills. Write us, outlining your problem, and we will give you an estimate showing how inexpensively you can obtain complete pest control in your mills and warehouses with LIQUID HCN.
*Registered U. S. Patent Office
American Cyanamid & Chemical Corporation
Insecticide Department
30 ROCKEFELLER PLAZA, NEW YORK, N. Y.
KANSAS CITY, MO.; AZUSA, CALIF.

lease of the goods for relabeling. Irrespective of whether the canner has already been paid for the particular shipment, to the extent that he is civilly responsible upon his guarantee he has a direct financial interest in any seizure of goods which he has packed and shipped under a buyer's label.

In the event of seizure, the limitation in the affirmative guarantee and the undertakings by the buyer come into operation. Except for misbranding resulting from the failure of the product to conform to the label supplied by the buyer, the recommended form of guarantee throws upon the buyer the responsibility for all other types of misbranding arising out of the arrangement of the buyer's label, its design, the prominence of the statements, etc. The seller may in such cases require the buyer to appear as claimant, or, if the seller appears as claimant, to indemnify the seller for any losses, court costs, attorney's fees or costs of relabeling.

The recommended approved form of guarantee further provides where a canner has any doubts whatever concerning the propriety of a buyer's label, he can by *written* communication question the propriety of using the particular label. If the buyer insists upon its use, and if the product is later held to be misbranded in a seizure or other action, and financial loss to the canner results, he may hold the buyer responsible in a civil action upon the buyer's undertaking. It is therefore important that whenever any question arises concerning the use of a particular label supplied by a buyer, the canner **formally communicate with the buyer in writing and call this fact to the latter's attention.** It would likewise be desirable that in such communication the canner call specific attention to the second clause of the recommended approved guarantee and to the buyer's responsibility thereunder.

Inadvisability of Using Different or Broader Guarantee Forms

The recommended approved form of federal law guarantee, which has been approved by the distributors' associations, represents the result of careful study of the problem. In period of adjustment accompanying the coming into effect of the new law, other and possibly broader forms of guarantee may be offered to canners. Frequently, these suggested forms go far beyond the purposes and the requirements of a guarantee under the federal law. Occasionally, they are so broadly worded as to require the canner to indemnify the buyer against any and all claims which may be made by consumers, irrespective of the validity of such claims. The Association has never recommended the use of any indemnity agreement of this type since it is felt that the ordinary implied warranty of quality and merchantability adequately covers the situation. Moreover, in most cases the operation of the Consumer Complaint Service affords protection to both the canner and the buyer.

The recommended approved form of guarantee does not deal with the question of state laws, and no conclusions concerning state law guarantees were reached during the Chicago meeting of the Joint Conference Committee. Inasmuch as many state laws are in the process of being amended to conform to the federal law, and it is expected that in most cases a guarantee under the federal act will suffice, the inclusion of provisions respecting state laws is not advised by this Association.

PERCOLATORS

Our standard percolator as shown will serve many demands, but is your problem different? Tell us what you need, and let us offer you a unit designed to fit your process.

MADE OF GLEAMING STAINLESS STEEL IN ANY CAPACITY

METAL GLASS PRODUCTS COMPANY
BELDING, MICHIGAN

CHICAGO	NEW YORK	SAN FRANCISCO	ATLANTA
201 N. Wells St.	155 E. 44th St.	175 13th St.	3950 Club Drive
State 2907	Murray Hill 2-6420	Hemlock 5626	Cherokee 3545

SAN-I-TANKS

Food Technology

(*Continued from page 339*)

Optimum absorption and optimum fermentation time are intimately related, in that one increases as the other decreases. Thus, a six-hour fermentation calls for less water than a three-hour fermentation. Conversely, for a given water content, the optimum fermentation time is shorter than it would be if less water were used. Hence, bakers should ration the water in each dough, not only according to the flour quality but also according to the alloted fermentation time.

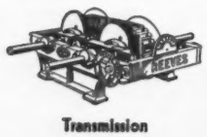
The elasticity modulus, since it has been found useful in the new test for optimum water absorption, has been studied in relation to aging. A decrease similar to that caused by thinning with water is observed. This suggests that water liberated by the protein acts to lower the elasticity modulus. Based on these findings, concerning the relation between absorption and fermentation time and the effects of aging, an improved system of test baking is outlined. It eliminates certain errors found in previous systems.

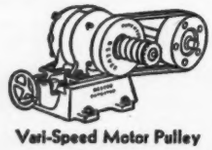
Digest from "Relation of Water Absorption to the Physical Properties and Baking Quality of Flour Doughs," by P. Halton, *Cereal Chemestry* 15, 282, 1938.

"Just Right" MACHINE SPEEDS
ELIMINATE GUESS WORK
IN FOOD PROCESSING . . .
REEVES
Length of time vegetables are held in this blancher to obtain proper color is accurately regulated according to maturity and condition by means of a REEVES Variable Speed Transmission. Any blanching time, from 2 to 16 minutes, easily obtained at will of the operator.

Guess work is expensive in the timing of any food processing operation. There is always one speed that is "just right" for each batch or product, and to obtain that speed, which may change many times an hour, leading manufacturers of food machinery provide *infinite speed adjustability* with REEVES controls. REEVES long experience in equipping *mixers, cookers, coolers, conveyors, filling* and *packaging machines, pumps,* etc., and the wide range of REEVES models and sizes available, assure correct application and dependable service. Send for Catalog G-384. REEVES PULLEY Co., Dept. FI, Columbus, Indiana.

THE 3 BASIC UNITS IN THE MODERN REEVES LINE


Transmission


Vari-Speed Motor Pulley

Motodrive

Reeves SPEED CONTROL

BEVERAGES

Orange Juice Made Stable

ADDITION of 1 part apricot sirup to 2 parts fresh orange juice stabilizes orange juice against development of off flavor, even when heat treated and canned. According to U. S. Patent No. 2,148,593, the resulting beverage has a rich yellow color and is superior in flavor, tang, and fragrance to either the fresh orange juice or the apricot sirup made from 75 parts by weight of finely broken up and steam-cooked apricot pulp sweetened with 25 parts sucrose and diluted with a 100 parts by weight of water.

While the use of orange juice from freshly picked, tree-ripened fruit at optimum stage of maturity is recommended, the apricot pulp may be from culls or orchard run to keep costs low and to provide a market outlet for that fruit.

When packed in 8 oz. containers, the empty cans are sterilized, preferably exhausted for 6 minutes at 212 deg. F., filled, exhausted for 5 minutes at 150 deg. F. and pasteurized for 15 minutes at 185 deg. F.

Chemical laboratory tests indicate a chemical reaction between the constituents of the two fruit juices, which stabilizes the orange oil against rancidity and other changes for the development of off flavors when exposed to the air or processed in canning.

The patentee, Peter Bias, San Francisco, Calif., explains that the higher the quality of the orange juice the lower is the ratio of apricot sirup needed to stabilize the orange juice.

Beer Freed From Bitter Sediment in Closed Fermenter

HERETOFORE, removal of bitter sediment concentrated in the foam formed during active fermentation in beer making has been possible in open vat fermenters only. It is manually removed by skimming off the foam several times during the vigorous fermentation period. A beer free from a characteristic disagreeable, harsh and bitter taste is the objective.

U. S. Patent No. 2,136,685 provides for a closed fermenter in which these bitter sediment particles may be removed from the foam automatically.

The main body of the fermenter vat has the same construction details as the open type. Over the greater length of each vat is built a flat horizontal ceiling. The surface of this ceiling is such that as the foam from the fermenting wort comes in contact with it, the sticky sediment particles adhere and are removable only by thorough cleaning of the vat when empty.

Over the remaining length of vat is built a surge chamber into which the excess foam and entrapped sediment is drawn by the removal of CO_2 through on outlet in top of the chamber. In the bottom of this chamber is a drain covered by a layer of wood shavings. As the liquid portion of the foam returns to the vat upon subsidence of the fermentation, its bitter sediment content is retained by the shavings.

For successful operation the fermenter must be filled with wort to such a level that the head space above the wort is insufficient to contain more than a portion of the foam produced.

The patent is assigned to Anheuser-Busch, Inc., St. Louis, Mo., by the patentee, Rudolf Gull.

CANNING AND PICKLING

Brix Better Than Baumé For Pickle Finishers

THE MAIN DIFFERENCE between Baumé and Brix graduations on hydrometer scales is that Brix reads directly the per cent of sugar by weight, whereas the Baumé scale gives only an indirect reading. Baumé hydrometer scales are cheaper but may cause an error leading to $2 to $8 extra cost on a 400-gal. tank of sweet pickles. Also may lessen uniformity of product.

Digest from talk by R. G. Surtzer, Mich. State College. Technical School for Pickle and Kraut Packers, Feb., 1939.

Method for Making Vegetable and Fruit Pulps

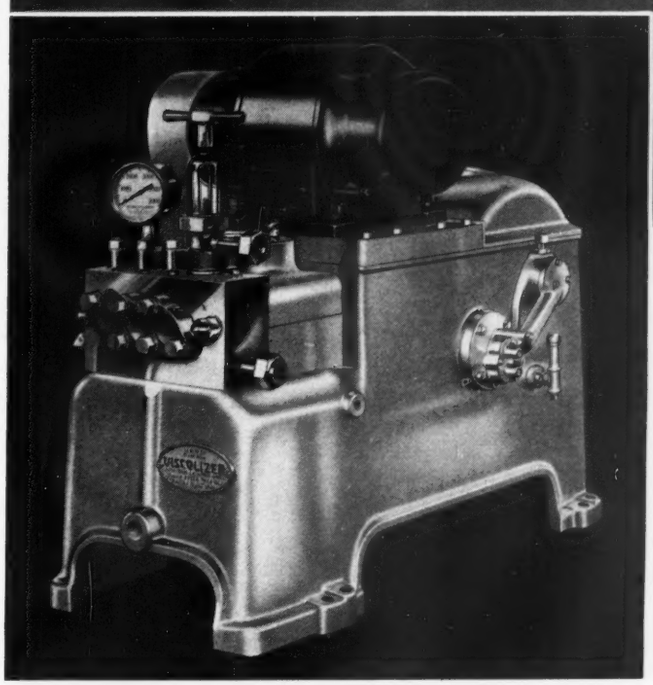
RAW FRUIT or vegetable pulps which keep well in storage are made by grinding fresh fruits, carrots, onions, spinach, dandelion leaves or beets on a roll mill or other suitable machine. Cane sugar, invert sugar or honey is incorporated in the pulp during the grinding; and if the acidity relations make it desirable, an edible acid may also be added. Citric, malic and lactic acids are suitable for the purpose.

An example of the invention, as disclosed in British Patent 496,358 (granted Feb. 23, 1939, to G., F. and H. Madaus, trading as Dr. Madaus & Co., Radebeul, Germany), is the pulping of fresh carrots with an equal weight of a sirup made from equal parts of artificial honey (invert sugar) and cane sugar sirup, together with 1 per cent of citric acid. The pulp is dried in a current of dry air, without the aid of heat, to a water content of about 30 per cent. Again, onions are pulped with honey and dried to 35 per cent moisture content, or dandelion leaves are pulped with an equal weight of grape sugar, acidified with 2 per cent of a mixture of citric and lactic acids, and dried to 25 per cent moisture.

Producing Dill Pickles In the South

GENUINE DILL PICKLES, fermented in barrels in North Carolina, were somewhat firmer if vinegar was added at the start. But they were no better when lactic acid or sugar was added. Bunging of the barrels, or washing the cucumbers, caused little or no

FOR EMULSIONS THAT MUST Remain in Suspension



DEFINITELY essential to the high pressure processing of all food products in which the emulsion must always remain in suspension the NEW CHERRY-BURRELL VISCOLIZER further assures this being done under the most sanitary conditions. There are no threads on the inside of the cylinder and all passages are machined to sanitary smoothness. The cylinder block can be removed, taken apart and reassembled in less than an hour. Packing boxes are readily washed. And a generous use of *stainless steel* further assists the sanitary advantages of this new and long awaited Viscolizer which comes in sizes from 100 to 1,000 gallons per hour. Ask your Cherry-Burrell representative to tell you more about them — or write us.

CHERRY-BURRELL CORPORATION
427 W. RANDOLPH ST., CHICAGO

difference. Rolling the barrels occasionally during the first week, kept brine strength uniform.

Digest from talk by Jones, Veerhoff, Veldhuis and Etchells at Mich. State College, Technical School for Pickle eand Kraut Packers. Feb., 1939.

CONFECTIONERY

Dextrose Confectionery Creams

METHOD of making confectionery creams without boiling and heating of sugar sirup to control crystal formation is the discovery covered by U. S. Patent No. 2,146,178, issued to Jesse K. Farley, Jr., Evanston, Ill.

The procedure is to make a solution of purified commercial dextrose at 180 deg. F. containing from 15 to 30 per cent water, cool to below 120 deg. F., seed with about 1 per cent of fine, needle-like dextrose hydrate crystals, and add cool corn sirup to slow up crystal formation and to cool mass further with agitation but without beating until needle-like crystals form throughout the mass. While still in a fluid state, the cream is deposited in molds or containers where complete solidification takes place. Depositing temperature is about 90 deg. F.

The molded forms are suitable for covering with chocolate and marketing as chocolate covered confections. That run into containers may be stored for future use or marketed as a commercial product for such confectionery or other uses as its smooth consistency makes desirable.

Chocolate Refining Speeded Up

RAPID REMOVAL of undesired volatile constituents, retention and development of desired flavors, breaking up of coral-like sugar clusters with resultant development of smooth texture, reduction of moisture content to 0.1 per cent or lower with lowering of viscosity, and marked saving in power and cocoa butter requirements are covered by claims in U. S. Patent No. 2,147,184 dealing with a method and means of treating chocolate and similar semi-liquid or plastic materials.

The grinding or refining action is done under a pressure of 1½ to 3 atmospheres by the injection of dried, tempered, and filtered air finely dispersed through the circulating mass of chocolate in a jacketed conche. As the air escapes when the chocolate is forced into a zone of atmospheric or less than atmospheric pressure it carries with it the undesired volatiles and the moisture vapor. The breaking up of the coral-like sugar clusters results as the paste is forced through small apertures by the greater than atmospheric pressure.

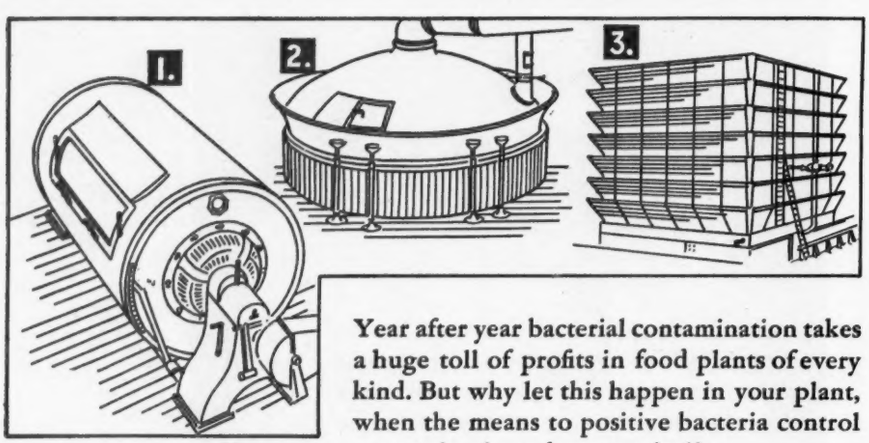
Machine designs for carrying out the operations are described by Kai Christian Sophus Aasted, Gentofte, Denmark, who assigned part interest to Boggild & Jacobsen, Copenhagen, Denmark.

DAIRY PRODUCTS

How To Hasten Ripening of Cheese

A NOVEL MEANS of accelerating the ripening process in cheese is disclosed in German Patent 666,813 (granted Oct. 28, 1938, to George Friedel, Dresden, Germany). The invention is simple and uses only oxygen (or air) as the ripening agent, but the manner of increasing the exposure to oxygen is new. A colloidal material, suitably one which is closely related to the cheese itself in composition, is beaten to a froth and spray dried in air. The resulting bulky

Prevent Spoilage, Protect Quality
WITH HTH PRODUCTS



Year after year bacterial contamination takes a huge toll of profits in food plants of every kind. But why let this happen in your plant, when the means to positive bacteria control are so simple and economical?

1. To prevent off-flavors and lowered quality in butter, it is essential to keep churns free from bacterial contamination. In addition to the regular thorough rinsing and cleansing, they should be treated before each use with a 200 p.p.m. solution made from HTH Products.

2. In breweries, HTH Products protect product quality by dependable sterilization of all utensils, pipe lines, filtermass, fermenters, bottles and bottle-fillers, etc.

3. Algae in condenser water causes slime in cooling towers, cuts down the efficiency of the refrigerating system. Ice plants use HTH Products to kill algae in cooling water, also to insure pure water for making ice.

HTH Products*are chlorine sterilizers in convenient powder form, always full-strength and dependable in action. Added to water, they quickly make fast-killing hypochlorite solutions of the desired strengths for flushing, wiping or spraying all surfaces with which food products come in contact. And being in concentrated form, HTH Products are so economical to use that their positive germ-killing action can be applied throughout the entire plant.

Let HTH Products go to work in your plant now—help you prevent spoilage losses and protect the quality of your finished products. Send for literature and full information.

HTH PRODUCTS
THE MATHIESON ALKALI WORKS (INC.) 60 E. 42ND ST., NEW YORK, N. Y.
*HTH PRODUCTS HTH, HTH-15 and Lo-Bax . . DRY ICE . . LIQUID CARBON DIOXIDE . . AMMONIA, ANHYDROUS and AQUA . . CAUSTIC SODA . . . SODA ASH . . . BICARBONATE OF SODA . . LIQUID CHLORINE . . BLEACHING POWDER . . PH PLUS FUSED ALKALI . . GYPSUM PRODUCTS

powder (dried froth bubbles) is incorporated in the curd, or in the raw cheese, thus introducing a relatively large volume of entrained air. Ripening is hastened by this intimate admixture of fine air bubbles with the cheese.

The colloidal powder may be casein, neutralized with potassium, calcium or ammonium hydroxide. Another colloid which is effective, but is not similar to cheese in composition, is methylcellulose. If air alone does not suffice to give the ripening effect desired in a given case, the air used for treating the colloid after spray-drying the froth may be fortified with oxygen or ozone. To prevent escape of air, the treated cheese may be coated with a film of methylcellulose.

Bacteriology of Paper Milk Containers

HERE IS a comprehensive review of the present bacteriological status of the paper milk container by one who has been active in the investigations. It is much too long and detailed for abstracting here. Boiled down to a few words it may be summarized thus:

The U. S. Public Health Service Milk Ordinance and Code of 1936 places the standard of efficiency for washing and sterilizing glass milk bottles at not more than one bacterial colony per cubic centimeter of bottle capacity. This amounts to almost 1,000 bacteria per empty bottle. On the other hand, paper milk containers run about 80 per cent sterile and the remainder average about 2 colonies per container. The hot paraffin treatment destroys all pathogenic bacteria and many other forms; and, by the use of paper which has been made under proper sanitary control, very few other bacteria get into or onto the container. Paper containers thus are O.K. from the sanitary viewpoint.

Digest from "The Present Status of the Paper Mill Container," by F. W. Tanner. *Journal of Milk Technology*, 2, 4, 1939.

SUGAR AND STARCH

Emulsifying Agent From Starch Factory Wastes

AN ECONOMIC ADVANTAGE possible from treatment of factory wastes or sewage is represented by subject matter covered in U. S. Patent No. 2,147,241 granted to Mark Cantor, Berwyn, Ill.

Waste material dealt with in this case consists of (*a*) refinery sludge filtered from neutralized starch converter liquors containing palmitic, oleic, and linoleic acids; (*b*) wash liquors from the refining of corn oil containing a mixture of stearic, palmitic, oleic, and linoleic acids, and (*c*) mother liquid removed by centrifuging or pressing dextrose crystals resulting from acid conversion of starch and containing a mixture of dextrose, gentibiose and isomers, and other complex impurities.

The fatty acids from (*a*) and (*b*) may be recovered as fatty acid derivatives and used as such or may be further processed with the recovery products from (*c*) for the formation of an emulsifying agent. This final product is identified as a mixture of carbohydrate fatty acid esters.

The patent is assigned to Corn Products Refining Co.

Lactic Acid From Sugars

TO FERMENT LACTIC ACID from fermentable sugars *Lactobacillus delbrückii* is perhaps the most useful. Cultures are maintained on a 10 per cent malt mash, transferred every 3

DON'T GIVE YOUR SECRETARY THE JITTERS

● When you need sanitary fittings or pumps—any size, any type or metal—contact your nearest TRI-CLOVER supply house. TRI-CLOVER is the COMPLETE line. You get quick, dependable service.

Leading supply houses throughout the nation stock and recommend TRI-CLOVER products. Write for the name of your nearest dealer.

TRI-CLOVER MACHINE COMPANY
2809 Sixtieth St. Kenosha, Wisconsin

TRI-CLOVER • SANITARY PUMPS, FITTINGS VALVES AND TUBING

or 4 days. Seed cultures are grown for 24 hours on a molasses mash containing 5 per cent sugar, half the usual amount of $CaCO_3$, and a slight excess of nutrients over the amount used in final mashes.

The calcium carbonate in final mashes is calculated as the theoretical amount to completely neutralize a 95 per cent yield of lactic acid. Fermentation temperature at 50 to 52 deg. C is as high as you can go.

Yields from 94 to 96 per cent in 3½ to 6 days are obtained from molasses. Best accessory nutrients are steep water, thin grain residue, or malt sprouts.

Digest from "Nutrient Requirements of *L. delbrückii* in the Lactic Acid Fermentation of Molasses," by H. R. Stiles and L. M. Pruess. *Journal of Bacteriology*, **36**, 149, 1938.

MEATS

Meat Color Stabilized

STABILIZATION of normal color in fresh meats and of desirable pink color in cured meats depends upon the absence of hemoglobin (fresh blood pigment) oxidation products in the fresh meat and of the nitrosohemoglobin (nitrate pickled blood pigment) oxidation products in cured meats.

Among other methods of preventing deterioration of these desired colors is the use of reducing sugars as described in U. S. Patent No. 2,147,261 assigned to Corn Industries Research Foundation, Roby, Ind., by Winford Lee Lewis, Evanston, Ill.

The reducing sugars named are starch conversion sirups and sugars (dextrose), maltose, levulose, lactose and invert sugar, with preference for dextrose.

Recommended time of use is while the fresh meat, pork sausage, or beef hamburger still has its fresh color and in the early stage of curing particularly in the case of the short cure process. However, under favorable conditions deteriorated color can be improved towards the desired color by use of the reducing sugars. Also indications are that 50 per cent of the reducing sugar may be replaced by sucrose.

MISCELLANEOUS

Chemical Elements Essential for Life

GRADUALLY our knowledge of the chemical elements that are essential to life is enlarged. Fairly recent additions to the list are manganese, molybdenum, cobalt, and gallium. The known list now stands at 22, possibly more. From this the author has suggested a form of chemical periodic table based on sub-atomic chemistry which, he hopes, will stimulate systematic search for the other essential elements. One of these may be columbium.

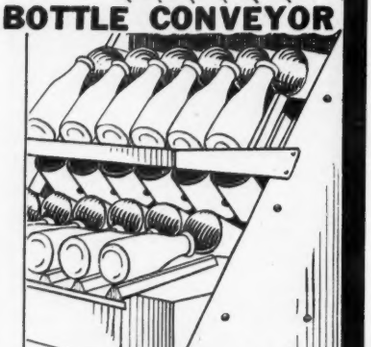
Digest from "Correlations Between Biological Essentiality and Atomic Structure of the Chemical Elements," by R. A. Steinberg. *Journal of Agricultural Research*, **57**, 851, 1938.

Mannan From Tubers

JAPAN'S KONJAK, from konjak *(Amorphophallus rivieri)* tubers, has a rival in "iles meal" from Java. Iles is a native Javanese word meaning to grind very fine. The meal is prepared from *Amorphophallus oncophyllus* and *Amorphophallus variabilis* tubers, native to and now cultivated in the Dutch East Indies. The wild tubers contain crystals of calcium oxalate, which make them disagreeable to eat, but this defect has been over-

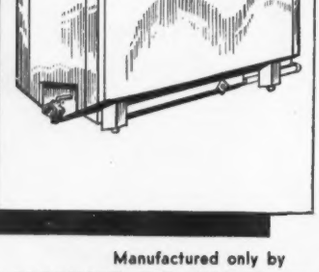
Two more TOUGH Cleaning Problems MADE EASY with Oakite Cleaning

REMOVES SCALE FROM BOTTLE CONVEYOR



A quarter inch layer of lime scale on bottle washing machine conveyor chains was causing excess power consumption . . . and reducing bottle washing efficiency in one beverage plant. But they found a way to remove this scale deposit quickly, safely, completely by using Oakite Compound No. 32. Conveyor is now as clean as the day it was installed! If you have a similar problem in your plant, let us help you solve it the easy, low-cost Oakite way.

PASTEURIZER VATS CLEANED FASTER



Cleaning spray type pasteurizers required too much time and work in a certain southern milk plant. It was only after long tedious brushing that residues were removed from surfaces. How different everything is now! Using a remarkable new material . . . Oakite Composition No. 63 . . . the same type of equipment, including other units, are cleaned in far less time, with less effort and most important, at less cost.

Let us send you fact-filled, FREE booklets describing economical, safe methods for cleaning all milk processing equipment. Write today.

Manufactured only by
OAKITE PRODUCTS, INC., 26G Thames St., New York,
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OAKITE CERTIFIED CLEANING
MATERIALS & METHODS FOR EVERY CLEANING REQUIREMENT

come in cultivation. So popular is iles meal that it is even exported to Japan where it competes with konjak.

Unlike potatoes, the tubers are composed of mannan instead of starch. Mannan is related to starch in composition, but has distinctive properties as an edible product. It is palatable, but its popularity is due more to its unusual gelatinizing power, and consequent adaptability to many uses in cooking, than to its flavor. This same property makes iles meal useful for a number of industrial purposes, just as starch is used in many ways. For example, waste waters from refining coal tar contain colloidally dispersed compounds which are chemically valuable but difficult to recover. Fine prepared potato starch was formerly used to flocculate these colloids, but mannan (iles meal) does the work even better.

Digest from "Iles Mannan Meal," by J. E. de Groot, C. J. van Hulssen and D. R. Koolhaas, *Chemisch Weekblad* **36**, 69, 1939 (Published in Holland)

Fine Grinding Gives Rancidity-Free Coconut Paste

GRINDING dried coconut meats at the rate of 180 lb. per hour in an 18-in. diameter hammer mill with a 6-in. width mill rotor and operating at 3,000 to 3,600 r.p.m. gives a product which is homogeneous, free-flowing above 75 deg. F., fully and quickly emulsifiable in water, and resistant to rancidity for at least four years, providing the meats have been dried to about 9 per cent moisture at not higher than 160 deg. F. and the mill is operated between 75 and 140 deg. F.

According to U. S. Patent No. 2,147,751 the mill hammers should have a traveling speed of 12,000 to 14,000 ft. per minute, the mill should be heated to about 100 deg. F. before the feed is started, and mill outlet should be a screen with $\frac{1}{16}$-in. diameter perforations to give best performance.

The resulting product melts easily to liquid state at 75 deg. F., is like soft butter above 70 deg. F., becomes hard and brittle below 70 deg. F. and emulsifies readily to milky appearance in water above 75 deg. F. It has use in confectionery as a filling and in pastry as a shortening.

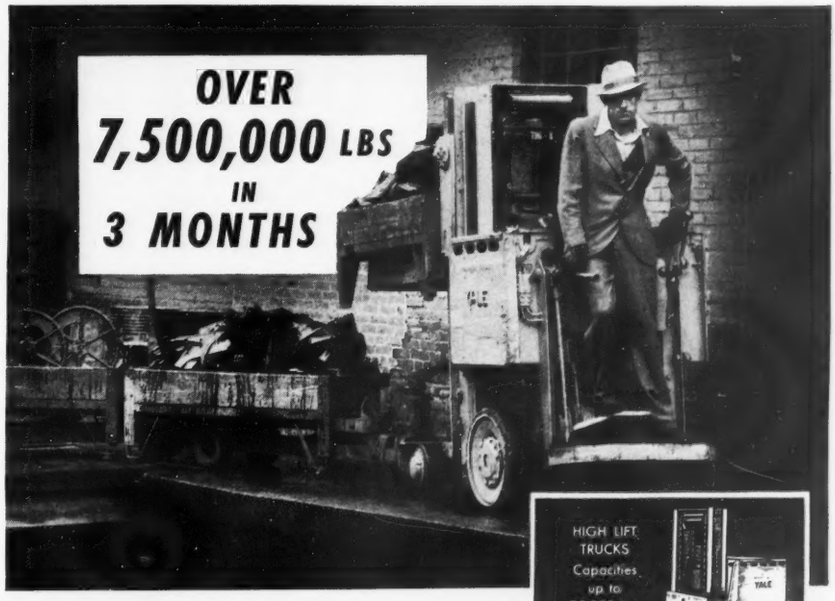
Robert T. Northcutt, Cranford, N. J., is the patentee.

Odor of Yellow Corn

THE ODOR which is peculiar to yellow corn persists in the fresh corn oil even after it has been saponified. Corn, from which all the oil has been extracted, does not have the odor. The odoriferous principle is volatile, for it can be distilled with steam. It is at least moderately stable, for steam distillation does not change the odor.

A concentrate was prepared by repeated partial distillation. The product was not obtained pure enough for exact analysis, and the yield was unexpectedly small, but the characteristic odor was so strong in this substance that the slightest trace of it on a glass thread would permeate an entire room. The yield is much better from extracted than from pressed oil, possibly because the pressing temperature is high enough to cause some loss by vaporization. Another possibility is that the germ holds the odoriferous principle in such a manner that pressing does not remove it efficiently. At any rate, pressed oil yields only about 1 part per million of the odoriferous substance.

Digest from "Isolation of the Compound Giving Yellow Corn its Characteristic Odor," by I. B. Johns and W. Oldham, *Cereal Chemistry* **15**, 377, 1938.



HANDLED WITH A YALE ELECTRIC TRUCK

7,500,000 lbs.—3,750 tons . . . A lot of tonnage in any man's language. Yet that's what one operator using a Yale High Lift Electric Truck is able to handle in 3 months for the Atlanta Plant of the King Plow Company.

And the units to be handled are not standard in size or shape. They run the gamut from metal scrapes to the heaviest die cuts. A real handling job if there ever was one.

Here's what the King Plow Company has to say about their Yale Electric Truck:

"This truck does a 4-5 day job in 11 hours . . . We find many jobs for this equipment which it was not originally installed to do . . . Almost before it was put to work it paid for itself . . . This truck never hesitates even for the longest and steepest ramps . . . . It is indispensable—has saved substantially."

Indispensable—Never hesitates—Saved substantially **. . . these words mean saving and efficiency to the King Plow Company. And they can mean the same to you—for the Yale Electric Truck always conforms to the same service standard—the best.**

It has to. Its drive units are more powerful . . . its construction is stronger—its engineering is more advanced. More than just a truck—the Yale Electric Truck is a mechanical efficiency expert! Send for free catalogue giving full information.

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BOOKS RECEIVED

CORRELATIONS BETWEEN ANNUAL PRECIPITATION AND THE YIELD OF SPRING WHEAT IN THE GREAT PLAINS. By John S. Cole. Published by the United States Department of Agriculture, Washington, D. C. 1938. 40 pages; 6x9¼ in.; paper. Price, 5 cents; for sale by the Superintendent of Documents, Washington, D. C. Data is given which will be of interest to executives and economists who want to estimate crop yields in advance.

CASEIN AND ITS INDUSTRIAL APPLICATION. Second Edition. Edited by Edwin Sutermeister and Frederick L. Browne. Published by Rheinhold Publishing Corp., 330 West 42d St., New York, N. Y. 433 pages; 6¼x9¼ in.; cloth. Price $6.50.

Consisting of scientific and technologic monographs, one of the American Chemical Society series, the new edition of the book was prepared to cover the conspicuous progress that has been made in the production and utilization of casein since 1927, the date of the first edition. Improvements in batch processes and in drying equipment, development of carefully controlled continuous processes, improvements in the manufacture of casein plastic, increased use of casein paint and development of synthetic textile fiber are among the reasons for the new edition.

There are twelve monographs in the book. These cover the organic and physical chemistry of casein, its manufacture, analysis and storage, casein plastics and glues, casein paper making, paints and the leather industry, and the alimentary and medicinal uses of the product. A thirteenth chapter gives uses and statistics.

A DICTIONARY OF FOOD AND NUTRITION. By Lulu G. Graves and Clarence Wilbur Taber. Published by F. A. Davis Co., 1914-16 Cherry St., Philadelphia, Pa. 1938. 423 pages; 5x7 in.; cloth. $3.50.

Many hundreds of terms used in the language of the food technologist, engineer and dietitian are defined. As additional value the dictionary includes 31 tables of such data as the constituents of the body, digestibility of foods, nutritive value of foods and uncooked and cooked dried fruit equivalents. There is also a bibliography.

SECOND TRADE AGREEMENT BETWEEN UNITED STATES AND CANADA. Volume III. Published by United States Tariff Commission, Washington, D. C., 1938. This is one of a series of digests of trade data with respect to products on which concessions were granted by the United States in the new trade agreement with Canada. Part I pertains to food products other than fish. Part II covers fishery products.

PATENTS

Vitamin D Concentrate Homogenized Into a Cream or Evaporated Milk Carrier and Sterilized Preparatory to Dispersion in Liquid Food Products—André E. Briod, Belleville and Bion R. East, East Orange, N. J. to National Oil Products Co., Harrison, N. J. Nos. 2,150,315 and 2,150,316. March 14, 1939.

Pure Yeast Cultures Propagated Through Repeated Transfers From Solution to Solution as Sugar Content of Each Solution is Depleted—Edmund Leith Kitzmeyer, Bloomfield, N. J. No. 2,150,329. March 14, 1939.

Perishable Foods Preserved by Contact With Ice Containing Hydrogen Peroxide—Rudolf Thilenius, Frankfort-on-the-Main, Germany to Deutsche Gold und Silber Scheideanstalt, Vormals Roessler, Frankfort-on-the-Main, Germany. No. 2,150,616. March 14, 1939.

Hearth Bread Baked in a Multiple Unit Pan—Joseph G. Jackson, Oak Park, Ill. to Edward Katzinger Co., Chicago, Ill. No. 2,150,623. March 14, 1939.

Bread Spread Made From Mineral Oil With the Aid of an Emulsifying Agent—Carleton Ellis, Montclair, N. J. to Ellis-Foster Co. No. 2,150,649. March 14, 1939.

Fat-Soluble Vitamin Concentrate Containing an Anti-oxidant Prepared by Subjecting Vitamin-Containing Oil With Added Anti-oxidant to High Vacuum Distillation—Kenneth C. D. Hickman, Rochester, N. Y. to Distillation Products, Inc. Rochester, N. Y. Nos. 2,150,683; 2,150,684; and 2,150,685. March 14, 1939.

Cotton-Seed Oil Treated to Recover Phosphatide Content—Benjamin H. Thurman, Bronxville, N. Y. to Refining, Inc. Reno, Nev. No. 2,150,732. March 14, 1939.

Glyceride-Type Oils Refined to Remove Free Fatty Acid and Color Impurity by the Addition of an Alkaline Refining Re-agent and Subsequent Agitation, Heating and Centrifugal Separation—Benjamin H. Thurman, Bronxville, N. Y. to Refining, Inc., Reno, Nev. No. 2,150,733. March 14, 1939.

Pickles Sliced Longitudinally and Transversely by Mechanical Means—Ray D. Williams, Portland, Oreg. to Libby, McNeill & Libby, Chicago, Ill. No. 2,150,735, March 14, 1939.

Cereals Preserved During Storage in Atmosphere Consisting of 1 to 10 Per Cent Oxygen, 1 to 5 Per Cent Hydrogen and 98 to 85 Per Cent CO_2—Aquiles Argentino Ginaca, Buenos Aires, Argentina. No. 2,150,827. March 14, 1939.

Hearth Bread Baked in a Pan With Sheet Metal Walls to Restrict Endwise Expansion—Ray C. Oltman, Pasadena, Calif. to The Edward Katzinger Co., Chicago, Ill. No. 2,150,864. March 14, 1939.

Standardized Plastic Creamery Product Made From 65 Per Cent Butter Fat Cream Through Dilution to the Desired Fat Content Level and Working Under Sub-Atmospheric Pressure and Reduced Temperature to Give Plastic State Without Separation of Standardized Liquid Content—Laurence P. Sharples, Ardmore, Pa. to Milk Processes, Inc., Philadelphia, Pa. No. 2,150,943 and No. 2,150,944. March 21, 1939.

Chewing Gum Flavoring Material Protected Against Injurious Reactions by Treating Base Ingredients with an Aldehyde Prior to Compounding—George A. Hatherell, Roscoe, Calif. to Frank A. Garbutt, Los Angeles, Calif. No. 2,151,101. March 21, 1939.

Dextrose-Containing Syrup for Use in Manufacture of Carbonated Beverages—John Hall Buchanan, Ames, Iowa to Corn Products Refining Co., New York, N. Y. No. 2,151,499. March 21, 1939.

Fruit Freed From Excess Moisture in an Automatic and Continuous Manner During Cooking in Container—William A. Smith, Lyndonville, N. Y. No. 2,151,623. March 21, 1939.

Liquid Foods Deaerated in a Continuous Manner During Processing Under Temperature and Pressure Control—Henry C. Stephens, to Natural Food Products Co., Orange, Calif. No. 2,151,644. March 21, 1939.

Egg Meats Broken-up During Pumping for Easy Removal of Chalazae and Easy Filtering to Give a Thin Homogenous Liquid Egg Material—Benjamin R. Harris, Chicago, Ill. No. 2,151,760. March 28, 1939.

Frozen Fish Glazed in a Water Glazing Bath Containing Non-Injurious Edible Water Soluble Materials Which Lower the Freezing Point of the Solution to Give a Glaze That is Tenacious and Highly Resistant to Cracking—Carl A. Hedreen, Seattle, Wash. and Harry R. Beard, Vancouver, British Columbia, to New England Fish Co., Seattle, Wash. No. 2,151,967. March 28, 1939.

Freshly Killed Poultry Bled While Passing Through Steaming Box on Tram Conveyor—Paul Onorato, San Mateo and Emile Weinaug, San Francisco, Calif. Nos. 2,152,082 and 2,152,083. March 28, 1939.

Raisins Washed and Freed From Heavy Foreign Material by Passage Over Inclined Riffle Table in Stream of Water—Ernest E. Martin, Fresno, Calif. to Rosenberg Bros. & Co., San Francisco, Calif. No. 2,152,143. March 28, 1939.

Yeast-Raised Dough Prepared for Baking in a Five Step Method—Henry Jung, Manhattan, Ill. No. 2,152,593. March 28, 1939.

Foods Made Resistant to Staling by Addition of Small Quantity of Reaction Product of a Non-Deleterious Aldose with Ammonia—Emil Ott, to Hercules Powder Co., Wilmington, Del. No. 2,152,602. March 28, 1939.

Gelatin Swelled by Treatment with a Non-Aqueous Glycerine Product Subsequently Extracted with a Volatile Organic Solvent and Softened with a Water Insoluble Oil—Egon Elöd, Karlsruhe, and Ernst Demme, Weinheim, Germany to Carl Freudenberg G. m. b. H. Weinheim, Germany. No. 2,152,627. April 4, 1939.

Glyceride Oils Extracted in a Closed System in a Continuous Manner—Henry Rosenthal, New York, N. Y. Nos. 2,152,664 and 2,152,665. April 4, 1939.

Fatty Oils Separated Fractionally According to Melting Points by Extraction With Selected Solvents and at Controlled Temperature Levels—Henry Rosenthal, New York, N. Y. No. 2,152,666. April 4, 1939.

Animal Oils and Fats Extracted from Dehydrated Animal Scraps by Hydro-carbon Solvent, Gaseous at Ordinary Temperature and Pressure—Henry Rosenthal, New York, N. Y. No. 2,152,667. April 4, 1939.

Dextrose Hydrate Crystallized from Starch Converted Dextrose Solution by Temperature Reduction and Slow Motion Agitation—Charles J. Copland, North Kansas City, Mo. to Corn Products Refining Co., New York, N. Y. No. 2,152,874. April 4, 1939.